

COAL MINING

UNIVERSITY MICROFILMS
313 N 1ST ST
ANN ARBOR, MICH

May, 1959

Volume 36, No. 5



Allis-Chalmers HD-11G at William Fiore mine, Russelton. In addition to this tractor, Fiore operates 4 other Allis-Chalmers units . . . HD-5G, HD-6G, HD-19 and HD-21.

AA-0488

Highway

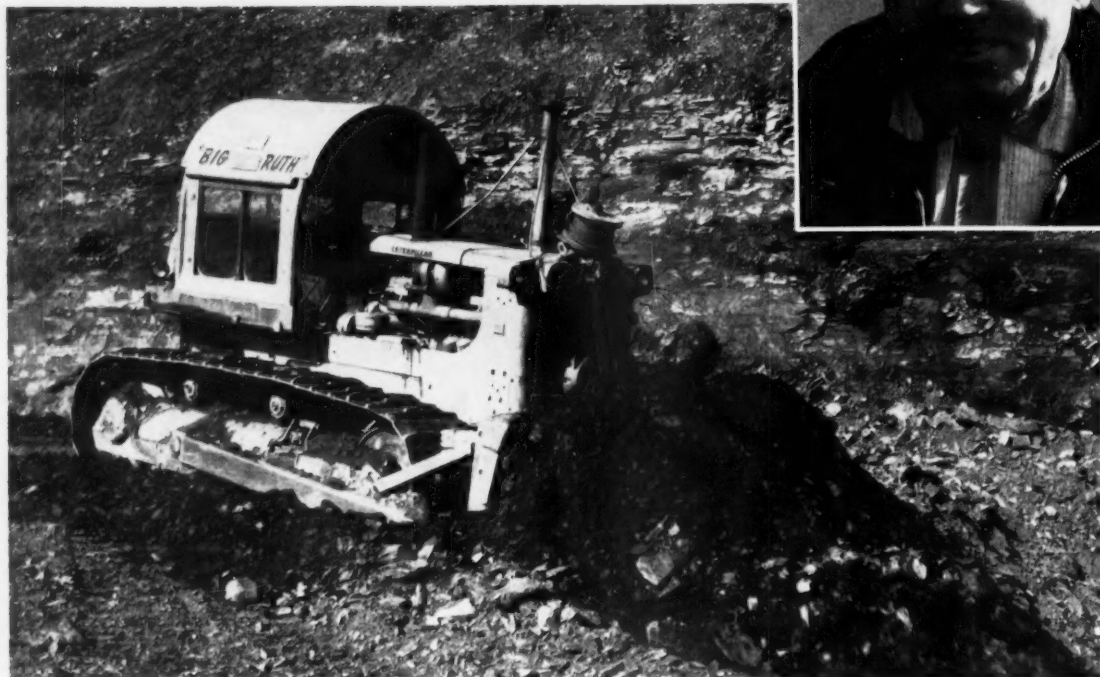


HIGHWAY EQUIPMENT COMPANY

6465 Hamilton Ave. • Pittsburgh 6, Pa.
40 Hoover Ave. • Du Bois, Pa.

*"When I buy my next tractor
... it will be another CAT[®] D9"*

S. C. Monnie
Glen Campbell, Pa.



*"... we've worked this D9 over 10,000 hours with
the original undercarriage ... except for one roller!"*

When a bulldozer works 10 hours a day, six days a week for over three years ... still has the original track and thirteen of the original 14 rollers, the owner has a right to be proud of his maintenance and satisfied with his purchase. It's also a good example of the quality built into Caterpillar products that keeps downtime to a minimum and maintenance costs at a realistic level. This Caterpillar Series D, D9 Diesel tractor owned by S. C. Monnie of Glen Campbell, Pa. works in clay, rock and shale and moves from 3,000 to 5,000 yards of dirt a day. On comparable jobs of the same owner, this D9 strips to the coal in one pit while a 3½ yard dragline works another. The D9 pit is loading out twice the amount

of the dragline pit. Here is proof of production!

Combine high performance and low upkeep in one unit and you have a machine that's worth every penny of your investment. Consider the many advantages of the 320 Horsepower Caterpillar D9, available in either direct or torque converter drive. Learn why these giants of earthmoving are preferred on stripping sites, highway construction projects and other earthmoving applications.

Let us give you all the facts so you can figure capacity, speed and quality of the rugged Cat D9 tractor on your own job. A card or phone call to our nearest location will bring you all the necessary information ... no obligation!

*Both CATERPILLAR and CAT are registered trade marks of Caterpillar Tractor Co.

BECKWITH
MACHINERY CO.

6550 Hamilton Avenue • PITTSBURGH • Phone: MONTrose 1-6900

BRADFORD, PA. • 361-369 Congress St. • Phone 3166
CLEARFIELD, PA. • Old Town Rd. • Phone 5-9635
ERIE, PA. • 1356 E. 12th St. • Phone 4-2494
SOMERSET, PA. • Rt. 219 N. • Phone Somerset 6533
CLARKSBURG, W.VA. • U.S. Rt. 20 • Phone Main 4-5476

HEAVY - RUGGED - POWERFUL



**LOWEST COST PER TON WITH
McCARTHY AUGER DRILLS**

**LIVE POWER • RAPID TRAVERSE
• EASY COUPLING PINS • SAFETY
AUGER GUIDE SIDEWAYS—FORWARD
AND BACK—MOVING SKIDS**

COAL RECOVERY "Walks" from hole to hole to auger high-quality coal

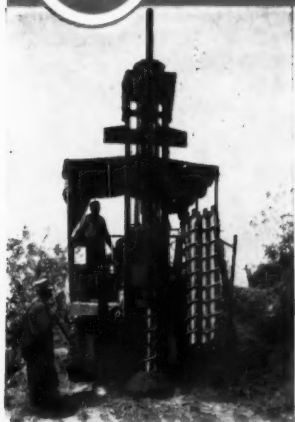
An Ohio miner removes 550 tons of coal in each 8-hour working day with this Model 14 36-42x12' McCarthy drill, operated by two men. He drills 42" dia. holes 144' deep. Auxiliary conveyor eliminates spillage at hole. It operates on either side of drill for working blind cut. Twelve different models of McCarthy Coal Recovery Drills mine low-cost "bonus coal".

Manufacturers of Drilling Equipment Since 1901



THE SALEM TOOL COMPANY

773 SOUTH ELLSWORTH AVE. • SALEM, OHIO, U. S. A.



**VERTICAL
MODEL 106-24**

**World's Fastest Heavy-Duty
Vertical Auger Drill**

Bores faster, deeper, larger dia. holes than any other auger drill. New gear reduction unit slows auger rotation for operation in hard rock formations. Drills 8" and 9" dia. holes readily in shale and sandstone formations, drills larger dia. holes up to 24" dia. in softer formations.

**HORIZONTAL
MODEL 104**

**Lowest Drilling Costs per
Foot, Self-Propelled or
Truck-Mounted**

Bores up to 12" dia. holes to 150' depth faster, cheaper than any other horizontal drill. Requires less working space, saves many man-hours... operates easily in tight, hard-to-reach locations.



FINGER-TIP CONTROL



**Gives Desired
Rotating Speed
of Auger**

HYDRAULIC FEED



**Provides Any Speed
up to 6 Feet per
Minute Horizontal
Feed of Drill**

VISIT OUR BOOTH NO. 2141 AT THE COAL SHOW

Published monthly by Modern Mining Publishing Company. Publication Office—Advance Printing & Litho Co., Erie, Pa. Editorial and Executive Offices—Erie, Pa. Pittsburgh Offices—P. F. JASIK, Publisher, 4575 Country Club Drive, Pittsburgh 36, Pa. Price: In the United States, \$3.00 year; all other countries \$5.00. Single copy 25 cents. Entered as second class matter at the Post Office at Erie, Penna., under the act of March 3, 1879.

FOR MORE PROFITS



STOCKPILING COAL for the William Aloe Coal Co., this 1¼-yd. shovel gets its power from a Cat D8800 Engine. A D13000 powers a 1½-yd. shovel, also stockpiling coal.



LOADING OUT COAL in the operation of the William Aloe Coal Co., this 2½-yd. shovel is powered by a Caterpillar D337 (Series F) Turbocharged Engine.

Standardize on CAT Diesel power for the tough mining jobs



A. J. Schmidt, Purchasing Agent of the William Aloe Coal Co. at Imperial, Pa., now relies on Caterpillar for 100% of his engine power requirements in coal loading operations

That's a sound move for *any* mine. When you're powered 100% with Cat Diesels, you're sure of dependable performance in *every* phase of your engine power requirements. Their reliability has been a by-word on punishing applications for more than 25 years, because they were built for the hard work. Today, as a result of constant development, these modern heavy-duty units are tougher and more efficient than ever.

One of the big reasons for the complete acceptance of the Caterpillar Engine is the fuel injection system. Here's how it provides profitable production:

1. Maintains loads for long periods without power drop.
2. Idles smoothly and runs steadily on all cylinders.
3. Handles variable loads with quick response.
4. Burns a wide variety of low-cost fuels without added maintenance costs.

ELECTRICAL POWER for exhaust fan, pin timbering machine, shop cutting machine, loader, conveyor to tippie, grinder and lights at Overfield, West Va., is furnished by a D337 Turbocharged Electric Set. Production: 300 tons a day. Owner: R. & L. Coal Co.



5. Is free from frequent checks and adjustments.

For complete information about Cat Engines and Electric Sets see one of Beckwith Machinery Company's Engine Specialists. He knows your power requirements and we back your purchase with fast, efficient service and high quality factory parts. For original or replacement power—for honestly rated, certified power—give us a call!

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

CAT INDUSTRIAL ENGINES 10 sizes up to 650 HP (maximum output capacity). Most leading manufacturers can furnish machines with Cat Engines on request.

CAT ELECTRIC SETS 12 sets up to 350 KW (continuous duty) with the Cat Generator. All Cat Electric Sets and Engines come with a notarized certificate of capacity.

STRIPPING OVERBURDEN from coal, this shovel with 5½-yd. bucket maintains profitable production powered by a Cat D397 (Series D) Turbocharged Engine. Owner: Keeley Construction Co., Clarksburg, West Virginia.



**FOR MORE PROFITS
PER TON RELY ON
CAT DIESEL POWER
FROM BECKWITH**

ENGINE POWER BY CATERPILLAR



FURNISHING POWER FOR THE ENTIRE TIPPLE, this Cat D397 Electric Set often starts Monday morning and doesn't shut down until Saturday night. Tipple consists of 2 crushers, 3 vibrators, 10 flight conveyors, furnace, air cleaner and washer. Production: 1,500 tons a day. Owner B. H. Swaney, Inc., Charlesburg, West Virginia.

Dept. CM, Engine Division

BECKWITH MACHINERY CO., 6550 Hamilton Ave., Pittsburgh 6, Pa.

Send me more information about Caterpillar Diesel Engines. I have checked the proper box to guide your selection of material.

- ☐ I would like detailed information, as I may be in the market for a Cat Diesel Engine or Electric Set. I understand that I am under no obligation.
- ☐ I am interested in learning more about these engines.

Name

Company

Address

City Zone State

BECKWITH MACHINERY CO.

BRADFORD, PA. • 361-369 Congress St. • Phone 3166
CLEARFIELD, PA. • Old Town Rd. • Phone 5-9635
ERIE, PA. • 1356 E. 12th St. • Phone 4-2494
FARRELL, PA. • E. Broadway • Phone Di. 6-3572
CLARKSBURG, W.VA. • U.S. Rt. 20 • Phone Main 4-5476

6550 Hamilton Avenue • PITTSBURGH • Phone: MONTROSE 1-6900

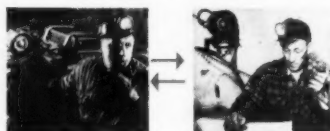
SEE YOU AT THE COAL SHOW: BOOTH 1009

*See how MSA's complete
product line helps
deliver full-shift
protection, more tons
per man*

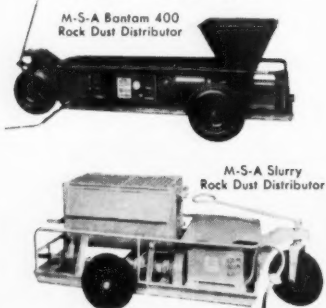
ILLUMINATION



COMMUNICATIONS



ROCK DUSTING



METHANE DETECTION



RESPIRATORY PROTECTION



HEAD PROTECTION



**AND SEE THESE BRAND NEW MSA PRODUCTS
WHICH WE'RE INTRODUCING FOR THE FIRST TIME:**

NEW M-S-A 20-Shot Blasting Unit

NEW M-S-A Mine Rescue Communications Unit

NEW M-S-A Mine Fire Control Dry Chemical

NEW M-S-A Thru-Steel Dust Collector

NEW M-S-A Fixed-Crown Suspension for MSA Caps and Hats

Other important new MSA products will be announced at the show!



MINE SAFETY APPLIANCES COMPANY

201 North Braddock Avenue, Pittsburgh 8, Pennsylvania

MINE SAFETY APPLIANCES CO. OF CANADA, LTD.
Toronto, Calgary, Edmonton, Montreal, Sydney, Vancouver, Winnipeg

COAL MINING

Vol. XXXVI

May, 1959

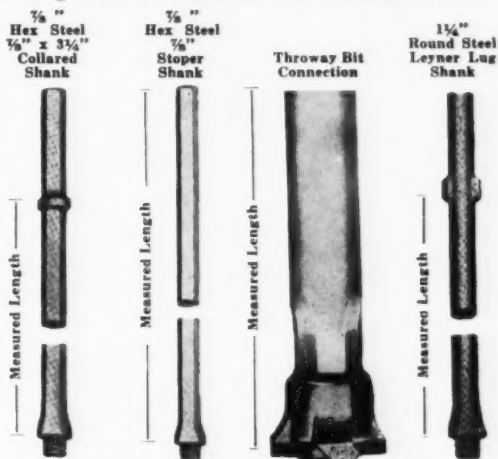
No. 5

Contents

Do You Know?	9
Here and There in the Coal Industry	9
Coal Mining Man, His Brain and Automation of His Industry	11
Coal Mine Automation Progress	12
Highway Equipment Company Adds Five New Lines	21
Coal Show Visitors to View New Caterpillar Products	22
Advertisers Index	32

TOOLS from MARS

Pittsburgh Call Zenith 0861 • Mars Call National 5-4688

Drill Steels Furnished with Any Type End
Reconditional Service
ROBERT T. WOODING'S INC.
MARS, PENNA.

Distributed by

LEE SUPPLY CO.
P. O. BOX 3 CHARLEROI, PENNA.
PHONE HUDSON 3-8933

Published by

**Modern Mining
Publishing Company**

4575 Country Club Drive

Pittsburgh, Pa. Phone TU. 1-9411

P. F. JASIK, Publisher and Editor



Printed by

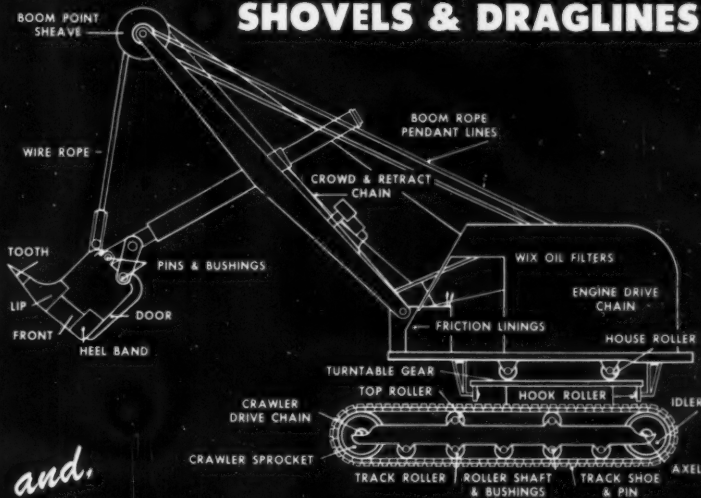
**ADVANCE PRINTING &
LITHO CO.**

1118 Chestnut St.

Erie, Pa.

Phone 2-2780

QUALITY REPLACEMENT PARTS FOR SHOVELS & DRAGLINES


and.

In a most modern and well equipped rebuilding shop

REBUILD TO STANDARD

 TRACK SHOES • TRACK IDLERS • TRACK SPROCKETS • BUSHINGS
 HOOK ROLLERS • HOUSE ROLLERS • TRACK ROLLERS • SHAFTS • DIPPER

MAXIMON MACHINE COMPANY, INC.

 ALTOONA, PA. • 801 N. LOGAN BLVD. • WINDSOR 3-1156
 GROVE CITY, PA. • HARRISVILLE RD. (RT. 58) • PHONE 1422

● A new D7 Tractor has been announced by Caterpillar Tractor Co. Featuring greater power, decreased maintenance requirements and higher lugging ability, it is designated the D7 Series D tractor.

The new machine becomes the third crawler in the Company's line to be powered by a turbocharged engine—joining the Cat D9 and D8 Tractors. The D7's engine develops 140 flywheel horsepower, an increase of more than 9% over the 128 rating of its predecessor. Drawbar horsepower has been increased from 102 to 112.

Significant to increased produc-

tion is the new D7's substantially increased lugging ability. Contributing to this is the higher torque rise of the engine. The tractor offers 19.6 per cent increase in drawbar pull as the engine lugs down under load, which is 80% greater lugging ability than the previous model—the highest in the D-7 class. An example of this characteristic may be drawn by comparing its rated and maximum drawbar-pounds pull. In first gear, the tractor is rated at 27,100 lbs. drawbar pull. However, under load the drawbar pounds pull increases to 33,250, a rise of 6,150 lbs.



The new Caterpillar D7 Series D Tractor has two increased power capabilities for higher machine production. First, the newly turbocharged D7 engine is rated at 140 flywheel horsepower, an increase of more than 9% over the 128 rating of its predecessor. Additionally, the new crawler has been engineered to deliver substantially increased lugging ability, up 80 % from the previous D7. Lifetime-lubricated rollers, dry-type air cleaner, and power-train refinements also constitute advancements.

The engine's high power-output provides more horsepower per pound of tractor weight than any crawler in its size class.

More efficient intake-air filtration and reduced servicing time are also afforded the engine by use of Caterpillar's dry-type air cleaner.

Other new D7 features reducing service time are lifetime lubricated rollers, carrier rollers, and idlers, with the exclusive floating ring seal. Built to keep dirt and contaminants out, and lubricant in, the rollers and idlers are lubricated during factory assembly, need no further lubricant until rebuilding.

Compared with the previous D7 rollers, the new ones have 25% greater beam strength, 10% larger shaft diameter, a 17% thicker thrust flange, and 2.8% more bearing area.

Power train components also show refinement over the previous D7. The transmission lubrication system has full flow filtration, with pressure-lubricated bearings. To assure maximum lubrication of transmission gears, they operate under a continuous spray of oil.

The pitch of final-drive gears has been made coarser, to provide beam strengths 16% greater in the idler pinion, and 49% greater in the final drive gear.

In-seat starting is available as an attachment.

SCOTTTDALE

MACHINE, FOUNDRY & CONSTRUCTION CO.

DEPT. CM

BOX 51

SCOTTTDALE, PA.

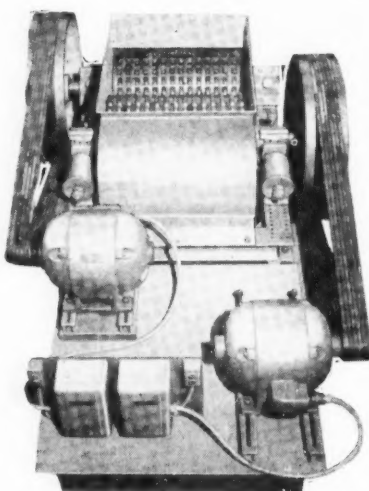
DOUBLE ROLL

COAL CRUSHER

EFFICIENT . . . produces a more uniform product!

ECONOMICAL . . . uses less power!

BOOSTS . . . sales—profits!



NO. 63 SPECIAL — 2 Motor Drive — Produces a Product $\frac{3}{4}$ " to 8". Equipped with Two Grooved Flywheels. (No Gears)

Efficient and practical the shredding action of the crushers' tooth studded double rolls turns out a more consistent product. Quality produced forged steel tooth gears, welded steel base, bronze bushed journal bearings, welded steel hopper and grooved flywheels.



Allis-Chalmers HD-21
clears path
for dragline at
W. G. Moore & Son.

Progressive mine operators, like W. G. Moore & Son, depend on Allis-Chalmers Tractors from *Highway*

At W. G. Moore & Son, Houtzdale . . .
and at successful mines throughout Pennsylvania,
you'll find fleets of big orange tractors . . .
powerful Allis-Chalmers HD-21s that guarantee
bigger production . . . and larger profits!

See your *Highway Equipment Company*
representative today! He'll be glad to present
facts about the complete Allis-Chalmers
line—first choice at leading mines.

AA-9923

Highway



HIGHWAY EQUIPMENT COMPANY

6465 Hamilton Ave. • Pittsburgh 6, Pa.
40 Hoover Ave. • Du Bois, Pa.



Ability to push bigger loads is outstanding HD-21 feature.

Two 6-yard draglines move

4,992,000 yds. per year . . .

work 6-day, 21 hour shifts...

Downtime measured in hours



Equipped with 6-yd. buckets and 100' booms, each dragline averages slightly more than one pass per minute.



Model 3000 shovel with 35' boom and 27' dipper sticks removing shallow overburden. Unit works up to two 8-hour shifts daily.



Model 3500 shovel has a maximum reach of 40' and operates two eight to nine hour shifts each day.

"There's no question but that the Manitowoc Model 4500 dragline just can't be beat for a 6-yard machine in an operation like ours," says Mr. W. P. Stahlman, owner of the W. P. Stahlman Coal Co., Corsica, Pa. Proof of Mr. Stahlman's statement is found in the company's output records. Using two of the 6-yd. Manitowocs, over 16,000 yards of overburden, from 10 to 70 feet deep, are removed daily. Operating a 21 hour day, six days a week, that means the two draglines remove close to five million yards a year! • "Despite the fact that we are using the draglines constantly, every week of the year, downtime can be measured in terms of several hours per year," Mr. Stahlman noted. • In addition to minimum maintenance, the two 6-yd. diesel powered, Manitowocs offer on-the-job and between job mobility that can't be matched by electric machines. When moving from one coal seam to the next, the 4500's crawl under their own power without extensive preparations and with a minimum time loss. When transported from one job to another they can be loaded on trailers or flat cars with minimum disassembly. • You can get more output and operating economy like this at your mine . . . your Manitowoc distributor has all the particulars. Call him now!

STAHLMAN'S 4-MACHINE MANITOWOC TEAM

2 Model 4500 6-yd. Draglines

1 Model 3500 Hi-Lift Shovel with 2-yd. dipper

1 Model 3000 Hi-Lift Shovel with 1½-yd. dipper

Manitowoc

BASSLER EQUIPMENT CO.
FORTY FORT, PA.

ANDERSON EQUIPMENT CO.
BRIDGEVILLE, PA.

SHOVELS 1¼-Yd. — 5½-Yd. • DRAGLINES 1¼-Yd. — 6 Yd.

Do You Know?

● A new earth hauling machine has eight electrically driven, six-foot wheels. It can self-load and haul 50 tons of dirt in one trip.

Built by R. G. LeTourneau, Inc., Longview, Texas, the machine has an electric motor geared into the hub of each wheel. These motors, as well as other motors spotted over the machine, are powered by a dynamo under the hood, which is driven by a 600-horsepower diesel engine.

The machine has two "buckets," not so much to haul the 50-ton capacity, but mainly to facilitate self loading. The rear bucket serves as a pusher to help load the front bucket. The weight of the loaded front bucket then increases tire traction to help pull-load the rear bucket.

During this operation, the bottom of each bucket becomes a huge electrically controlled spade, digging and scooping to load itself.

Simple electric controls govern all functions of the 74-foot-long machines. No clutches, transmission or other mechanical-drive components are used.

* * *

● Fledgling engineers are already working on the fully—automated factories of tomorrow.

The University of California at Los Angeles, for example, has received the principal parts of a tape-controlled machine tool system from Electronic Control Systems, Inc.

This Los Angeles firm's \$120,000 gift consists of a data entry unit, a special purpose computer, and a power supply unit.

Under the direction of Prof. Thomas A. Rogers, faculty and graduate students of the department of engineering will adapt a milling machine during the next 18 months to complete the system.

In applying the system, blueprint information for a given part is registered on a simple keyboard and automatically fed into the computer.

There the information is transformed into electric pulses recorded on a magnetic tape, each pulse moving the cutting tool one-thousandth of an inch.

The tape, finally, guides the cutting tool vertically, horizontally, or in arcs of a circle, as specified in the original blueprint.

The numerically-controlled machine takes circles, parabolas, and complex curves in its stride, and does the job faster, cheaper, and more accurately than the human hand.

The machine will be used to teach engineering students the techniques and concepts of digital control of machine tools, essential to tomorrow's production engineers.

HERE AND THERE IN THE COAL INDUSTRY



J. A. BOYLE

● J. A. Boyle has been appointed director mine-inspection for U. S. Steel's Coal Division.

At the same time it was announced that Wayne D. Snell is appointed chief mine inspector for the Division's Frick District, Uniontown, Pa.

Mr. Boyle was born in West Overton, Pa., where he obtained his early education. He commenced his employment with U. S. Steel in 1916 as an assistant machinist at the Frick District's Everson Shop.

● Appointment of 2 new coal industry sales representatives in West Virginia is announced by Norman T. Alexander, vice president, Austin Powder Company, Cleveland.

Willis S. Smith, who is located at Matewan, will cover the Williamson area in West Virginia and eastern Kentucky. Charles J. Sorbello, with headquarters in Bridgeport, will service the Clarksburg, West Virginia section.

Both Mr. Smith and Mr. Sorbello will handle sales of Austin's complete line of explosives, permissibles, blasting supplies, mine tools, drill heads and cutter bits.

● Mine Safety Appliances Company announced the appointment



WAYNE D. SNELL

of John P. Lytle as manager of engineering, Safety Products Division. He was formerly a project engineer of the company.

Mr. Lytle of 1057 Girard Road, Whitehall Borough, is a native of Pittsburgh, where he was awarded a degree in mechanical engineering.

During World War II, Mr. Lytle served overseas as airplane commander, and later as flight commander, from 1944 to 1945. He joined Mine Safety Appliances Company in 1953 as a project engineer after six years' association with Mesta Machine Company.

Mr. Lytle is married and the father of two sons, ages 10 and 7.



J. P. LYTLE, Mgr. of Engineering Mine Safety Appliances Company, Pittsburgh, Penna.

When better
equipment is
made...
you'll find it
first at
Highway



Allis-Chalmers HD-21 . . . ROBERT BAUGHMAN
COAL CO., Brookville.



Lima 2400 . . . ZACHERL COAL CO., Williamsburg.

At Highway you can choose from a complete selection of the world's finest equipment. Ranging from pumps to shovels, compressors to tractors, the various lines represent the best that is produced today.

And, when better equipment is available, you'll find it first at Highway, too!

AA-9147



HIGHWAY EQUIPMENT COMPANY

6465 Hamilton Ave. • Pittsburgh 6, Pa.
40 Hoover Ave. • Du Bois, Pa.

Allis-Chalmers • Lima Shovels, Cranes, Draglines
Master • Thor • Gar Wood
Lima Roadpackers • Jaeger
Michigan Tractor Shovels and Excavator-Cranes



Coal Mining Man, His Brain and Automation of His Industry



● All that man is today springs from legacies of a past that has been spectacular, unique and fantastic. Life's progress has been devious, traveling along erratic lines to reach uncharted ends with every end serving a potential new beginning. Man now stands at the end of his present line and at the beginning of another which indicates not only complete automation of his chores but travel into the universe and to control of his future evolution.

Originating in a salt water environment, in the far distant past, the backbone type of animal, to which man belongs, evolved a nerve that was first little more than sensitive and irritable. Sensitivity to taste and touch developed later. Still later a light sensitive nerve was evolved into an eye. The result was a system of nerves that constantly fired messages into a center mass of nerve cells. As the brainless animal emerged from his salt water environment into fresh water streams and onto land, his light sensitive eyes sent new kinds of messages to the center mass of nerve cells. After many millions of years of that kind of forced, combined use of all senses began to emerge awareness, intelligence and a semblance of a crude brain.

On land that animal, the then most advanced form of life on this earth, became subject to disease, famine and destruction by his own kind. The healthiest survived disease, the strongest, swiftest and most cunning hunter survived famine. Only the best fitted for competition reproduced in every following generation.

Time spent in treetops by our more immediate prehuman ancestors gave us our sense of color and our binocular vision; gave us eyes that move in conjunction with that binocular vision and gave us a sense of space, distance and the ability to converge all sight for purposive action. Of all ground animals only the human has color and binocular vision.

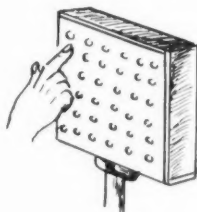
Coming out of the treetops and making his home on the ground, the Ape like animal, having more intelligence, not only developed into man but his larger brain enables him to by-pass natural selection, taking away from nature the power which it exercises over all other animals and plants. Man's brain enables him to acquire an unchanging body midst fauna and flora that is constantly evolving and vanishing. In man a being came into existence in whom the mind is more important than body structure. Through his intellect man is able to keep in harmony with the changing universe.

Compared with other animals, man has broken through the intelligence barrier. Compared with the near human Ape, the material basis of man's mind, the brain itself, has increased twofold in bulk and in fine complexity. Growth and maturing increased more than twofold and day-by-day excitation have also markedly increased. The outcome of this evolution of man's brain is a new level and scale of perception, a new level of general awareness, of storage of past history in the form of memory relating to sight, sound and motion and a sense of beauty. Our intellectual reach into matter and through

the universe are new on this earth and promise new glory that is freshly undeveloped and holds a much greater promise.

Knowledge, a product of the human brain, leads to practical and useful results. The coal mining industry has already reached the time of fear and danger of inadequate utilization of human intellectual resources to bring about automatic operation of its machinery industry. Human intellectual resources must be applied to arrange matters in such a way as to produce what is needed. Decision making in these matters must ultimately be based on values. Conflict over ends to be reached will be eliminated by increased knowledge.

Present coal mining man has his stake in the coal industry. His only hope for survival lies in progressive forward steps that will enable him to compete with other fuels of his time. In the past 40 years, the coal market has first stopped growing, then consistently diminished, proportionately with increased fuel demands. For the past decade competitive industry evolved from manual operation to remote control and to fully automatic operation.



Coal Mine Automation Progress

By: P. R. PAULICK
Consulting Mining Engineer
Bethel Park, Pa.

● Continued gas and oil competition plus the 1958 quickie recession in the United States and Europe reduced coal production to the 400 million mark, down more than 90 million tons from 1957. This intra-industry and external competition dictates the necessity of continued technological advancements to insure productive capacity of men and machines, with consequent cost reduction.

To date, mine mechanization has

● *The quickie 1958 U.S.A. recession, lost exports, together with continued intense gas and oil competition dictates a necessity for accelerated "COAL MINE AUTOMATION" to insure continued cost reduction and retain coal's hard won competitive position in the energy market.*

been the medium used to attain constantly lowered production costs. In the near future aggressive "Coal

Mine Automation" must be developed to replace or supplement mechanization.

Coal mine mechanization programs — surface and underground — contributed tremendously in the fight to retain coal's competitive position in the United States energy market. Intensive mechanization programs began about 1923, with expanding horizons to date. From this period on, through the various phases of the modernization and mechanization effort, the productivity of man constantly increased, rising from 8.8 tons per face man-day in 1923, to current 50-60 tons per face man-day. In especially efficient mines as high as 80-90 tons per face man-day. Figures #1 to #4 inclusive show this progressive betterment pictorially.

Moreover, during this same period the overall productivity of the American miner increased from 4.5 tons per man-day in 1923 to 11.0 tons per man-day in 1958 an increase of 146%. Furthermore, during this same period, the average unit price of coal FOB mine increased only 97%.

Thus, even while coal mine mechanization and modernization programs — surface and underground — have made great strides forward, permitting coal to be economically competitive in the American energy market, ever greater efforts must be

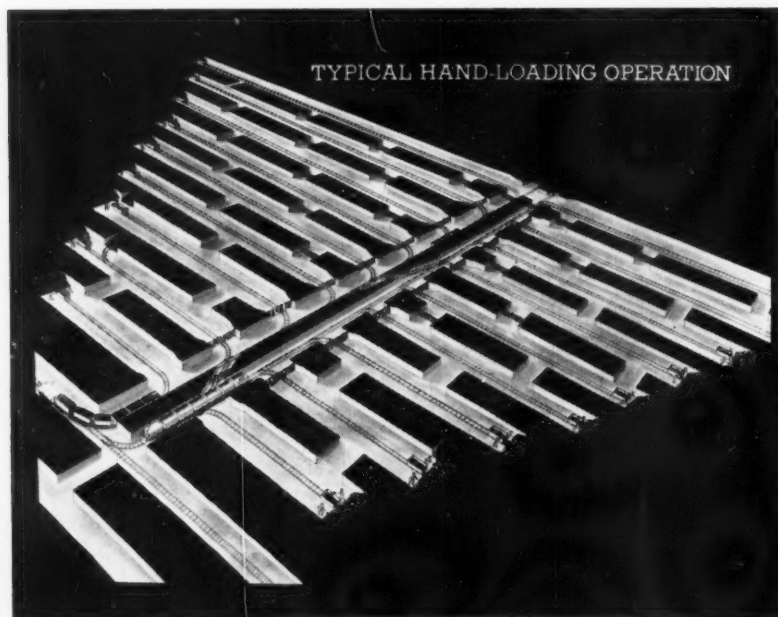


Figure 1—Typical Hand Loading Operation—Pre 1923. Using 18 places—41 men —360 tons—8.8 tons per faceman day.

made to maintain this position. This can and will be done by developing "Automation" mining systems, several of which are now in experimental stage. Coal mine productivity must continually expand or be passed up by competitive fuels.

In the field of electrical energy — coal's biggest customer — the main competition is gas and oil. Economically speaking, atomic energy will not be a competitive factor for many years — some authorities believe 10-20 years. Good hydroelectric sites are practically non-existent. This leaves gas and oil. However, competition from this source will soon be reduced or even eliminated by "Coal Mine Automation." Following table shows why: —

Year	Cost Per Milion B.T.U.		
	Coal	Oil	Gas
1952	27.3	33.1	14.5
1953	27.3	32.3	16.7
1954	26.1	32.8	17.3
1955	25.2	33.2	18.0
1956	28.1	37.9	18.5
1957	27.5	44.4	19.5

With the unit prices of coal remaining steady or even reduced — via Automation — and oil prices increased due to higher drilling and prospecting costs, and internationally via cracking of the current 50-50 profit ratio, and gas prices increase via the reversal of "Memphis decision" coal will have become the largest factor in the fossil fuel energy market. Electric heating of homes. "Coal by wire" will then develop snow-ball growth. This will mean a major increase in coal consumption and coal production. Automation will make this possible — sooner.

Mining Methods

The relative distribution by production methods of the 400 million ton 1958 production closely parallels results attained in 1957 when the 493 million tons produced were divided as follows: 73.2% of all coal mined was produced by underground methods with an overall national efficiency or productivity of 8.9 tons per man-day. Strip mine operations produced 25.2% of total with an overall productivity of 21.6 tons per



Figure 2—Typical Track Mining System—1923 to 1936. Using 10 Places—16 Men—360 Tons—22.5 tons per faceman day.



Figure 3—Typical Mechanized Trackless Mining System—1936 to 1948. Using 6 Places—10 Men—360 Tons—36.0 Tons per faceman day.

man-day. Auger mining methods produced 1.6% of total at an efficiency of 26.2 tons per man-day. For the United States mines as a whole, the overall productivity was 10.6 tons per man-day in 1957; and it is estimated to be 11.0 tons per man-day in 1958.

An indication of the recent relative efficiency of the three methods is shown by these figures. The underground mining methods productivity grew from an average of 6.4 tons per man-day in 1952 to 8.9 tons per man-day in 1957, an increase of 40%. Strip mining methods show an increase from 16.8 tons per man-day attained in 1952 to 21.6 tons per man-day in 1957 or a 29% increase. And auger mining grew from 20.1 tons per man-day in 1952 to 26.2 tons per man-day in 1957 or 30% increase. It will be noted that the underground mining methods shows

the biggest relative growth during the 6 year period. It will continue to grow at an ever expanding pace with the advent of coal mine automation.

An analysis of the relative merits of the three basic type mining methods as developed herein is very interesting. This analysis is based upon the "productivity" times "value" FOB mine factors. On this basis auger mining is 29% better than strip mining, and 120% better than deep mining. Moreover, strip mining is 72% better than deep mining. Furthermore, taking into consideration the relatively small capital investment needed to set up auger mining, the advantage is even greater.

While it is true that the relatively new auger mining method (first started in 1945 but growth was small until 1952) is the best and cheapest method developed so far,

nevertheless, this type of mining will remain restricted in its application. It can be used only in special cases and situations — removing highwalls after stripping operations is the best application so far. Thus the growth factor for this method is limited and will not be discussed further in this paper.

On the other hand, coal stripping operations — surface mining — has been practiced in the United States for many years. The general productivity growth of this type of mining has been steady throughout the years; rising from 5.1 tons per man-day in 1914 to 21.6 tons per man-day in 1957 or 324% increase. In 1957 stripping methods accounted for 25.2% of all coal produced in the United States.

So that while the field of operations for strip mining methods is not as limited as for auger mining, it cannot be said to be unlimited either. For even with today's huge (75 yds) earth moving shovels, and large (60-80 ton trucks) the physical seam characteristics needed for this type of mining will run into the law of diminishing returns. A carefully considered "guestimate" is that 30% of total production will be the top for this type of mining.

Thus we come to the "deep mining" operations, the subject of this paper. During 1957 a total of 360,000,000 tons or 73.2% of all production in the United States was from deep mines. Of this total 85% was mechanically loaded. It is firmly believed that the major portion of United States coal will be produced by underground methods; mechanically loaded with automation controlled machines.

This paper is basically concerned with this type of mining; "mine mechanization" and the coming "mine automation" systems.

The chart reproduced at the beginning of this paper shows every conceivable type of mobile mine mechanization systems used in underground mines today, including the attendant service haulage.

The original paper based on this chart, was published in the April, 1945, issue of the Mining Congress

TYPICAL BLOCK MINING SYSTEM

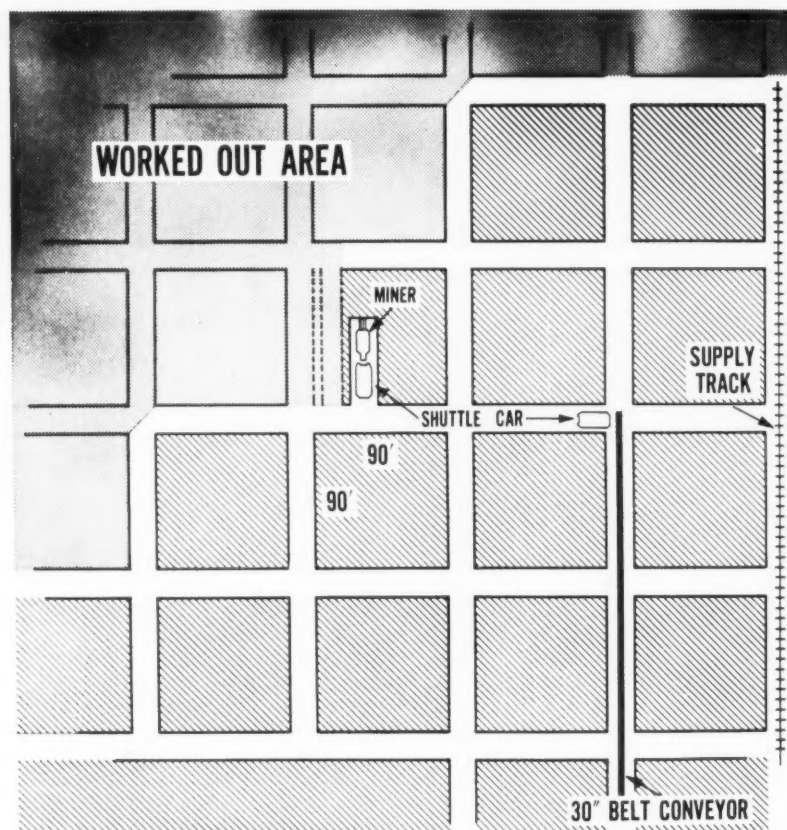


Figure 4—Typical Continuous Mining System—1948 to 1958. Using 1 place—5 men 400 tons—80.0 tons per faceman day.

NEW

CAT No. 619 Wheel Tractor CAT No. 442 Lowbowl Scraper

225 HORSEPOWER

30 MPH OPERATING SPEED

14 YD. STRUCK CAPACITY

OUTSTANDING STABILITY

UNEQUALLED MANEUVERABILITY



*and your CATERPILLAR Dealer bring you
a completely new earthmoving team!*



A high-speed earthmoving unit that sets new standards for high productivity, accessibility and operating economy.

Latest addition to the Caterpillar line of high-speed earthmoving equipment is the all-new No. 619 Series B Wheel Tractor and No. 442 Series B Lowbowl Scraper.

Thoroughly tested, this brand new earthmover is a 14 cu. yd. (18 cu. yd. heaped) unit featuring ground-hugging roadability, "years ahead" service accessibility, and high productivity. The No. 619, with Turbocharged 225 HP engine (and 20% torque rise), planetary final drives, unit construction, tubeless tires, a swing-away

dash, 2-jack steering, and the dry-type air cleaner has the design and performance features that insure superior workability on a broad range of applications. You'll find all this in the New No. 619-No. 442 unit—plus proved economy over any earthmover of comparable size.

One glimpse of it sprinting down the haul road will show you the difference! And, there's another big difference you can't see—but you know is there: Cat quality! Let us convince you with a demonstration!

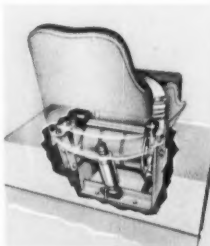
225 HP TURBOCHARGED ENGINE

Power for the No. 619 is furnished by a Cat-built Diesel Engine. It develops, at 2000 RPM, 225 HP (maximum) with a 20% torque rise—ideal for lugging ability under load and fast acceleration. The Turbocharger has been designed to provide outstanding performance characteristics. No. 619's exclusive Cat-built fuel system permits use of economy-type fuels without fouling.



SMOOTH RIDE, MORE COMFORT, SAFETY

Superior ride qualities inherent in the No. 619 provide a stability and smoothness never before found in two-wheel tractors of comparable size. Exclusive Cat Torsionflex seat, plus a new concept in tractor-scraper unit construction and weight distribution, dampen shocks of high-speed operation. Operator can run his machine faster, work longer with less fatigue.





NEW

CAT No. 619

SERIES B

WHEEL TRACTOR

CAT No. 442

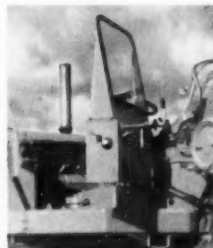
SERIES B

LOWBOWL SCRAPER



UNIT CONSTRUCTION SIMPLIFIES SERVICING

Basic components such as the flywheel clutch or transmission, differential and cable control, can be removed as single units to facilitate servicing. Interchangeable planetary final drives contribute to over-all accessibility and easy servicing.



SWING-AWAY DASH FOR EASY ACCESS

Easy access to starting engine, compressor and hydraulic pump is afforded by a swing-away dash arrangement. Entire left side of the engine can be exposed without disassembling major components connected to dash. This can greatly simplify and speed servicing when required.

GET ALL THE FACTS! We'll gladly show you how this new two-wheel rig can boost production, cut costs, help you bid more competitively. Call us or write Caterpillar Tractor Co., Dept. I6195, Peoria, Ill.



90° TURNS, EASY MANEUVERING

New 2-jack hydraulic steering system provides greater turning effort coming out of a turn than going in. Complete turn-around in approximately 30 ft. Bumper to push block length is 36' 7 1/2".

ADDITIONAL FACTS ABOUT THE NO. 619—NO. 442

TRAVEL SPEED: 1st 2nd 3rd 4th 5th 6th 1st Reverse 2nd Reverse
MPH: 3.0 6.1 9.1 13.9 19.9 30.2 3.5 7.1

TRANSMISSION: Caterpillar-built, constant mesh spur and helical gear, pressure lubricated.

CLUTCH: Double dry plate with semi-metallic friction surfaces. Diameter of plate—16 inches.

BRAKES: Air actuated (synchronized to brake scraper first). Drive wheels may be braked individually. Diameter and width 20 1/4" x 7".

TIRES: 26.5-25, 24 ply tubeless tires all around. Optional sizes and ratings also available.

Choice of in-seat gasoline starting or direct electric starting . . . fuel tank capacity 85 U.S. gallons . . . shipping width—10' 10".

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



NEW LOWBOWL SCRAPERS *move more material... more efficiently*

Caterpillar Scrapers for the DW20 and DW21 were first in the field with Lowbowl design, featuring a longer, wider bowl that fills quickly and easily—and many other fast loading developments. They've earned their reputation as the lowest-cost-per-yard producers.

Now, Lowbowls take another big step ahead! For example, many new developments have been made in the No. 456 Series B and No. 470 Series B Lowbowls that result in improved performance, better service life, less maintenance and greater capacity.

- Major components have been strengthened—Lowbowl Scrapers have stronger draft frames, box section bowl construction for rocky materials, and a new and stronger push frame arrangement that transfers pushloading force directly to the bowl.
- Greater size—capacity is increased to 19.5 cu. yd. struck, and 27 cu. yd. heaped.
- Strengthened apron, relocated apron pivot points give wider opening for unloading practically any material.

Net result is more production, more profits to you! Let us prove it. Stop in today!

YOUR CATERPILLAR DEALER

BECKWITH MACHINERY COMPANY

6550 Hamilton Avenue, Pittsburgh, Pa.
Old Town Road, Clearfield, Pa.
361-369 Congress St., Bradford, Pa.
1356 E. 12th St., Erie, Pa.
Route 219 North, Somerset, Pa.
Buckhannon Pike — Route 20, Clarksburg, W. Va.

OHIO MACHINERY CO.

6606 Schaaf Road, Cleveland, Ohio
930 Kinnear Road, Columbus, Ohio
2807 Reynolds Road, Toledo, Ohio
U.S. Route 250, Cadiz, Ohio
4000 Lake Park Road, Youngstown, Ohio

WALKER MACHINERY CO.

1545 Hansford Street, Charleston, W. Va.
4010 Emerson Ave., Route #2, Parkersburg, W. Va.

CM-8

DW 1503

Printed in U.S.A.



YOUR NEW EQUIPMENT INTERESTS ME—tell me more!
Send more information on the following:

- ☐ No. 619 Series B Wheel Tractor and
No. 442 Series B Lowbowl Scraper
☐ Cat Lowbowl Scrapers for larger
Cat wheel Tractors.

Name

Firm

Address

City State

Journal. Second version or revision, was published in February, 1955 issue of the same magazine, when the addition "continuous" mining systems was incorporated.

Present revision is made to include "Automation" coal mining systems now being developed with several experimental units in shakedown operation.

"Automation" is herein distinguished from "remote" controlled machines or miners as such. Remote control consists as a rule of some means or devices whereby an operator is stationed some safe distance from the miner itself, but within sight or sound of that machine. Actual operation of the machine is still controlled by a man operator, even though he is not at the loader itself. This distinction is important.

On the other hand, coal mine automation or automatic mining does not depend upon human or manual control of the loading unit. All controls; up and down, sideways, advance, retreat, etc. are made automatically, controlled by sensing devices, electronics, etc., placed at proper points on the loading unit.

"Remote" Controlled Miners

One of the first major attempts to utilize "remote" control of loader action was conceived and developed by the Union Carbide Miner in 1950-52.

This miner was designed to operate in "outcrop" or highwall mining similar to auger mining. It was used in the #5 block seam ranging from 48" to 54" in thickness. Bottom and roof reasonably good. Like auger mining a highwall coal face is prepared by cleaning up, bulldozing, etc., to provide about 35 feet minimum clearance between face and spoil. Belt conveyors were tried for surface transportation to tippie, but were later replaced with trucks due to curves, hills, etc.

This unit was planned and designed by Union Carbide engineers and consisted of a double decked, self propelled rig. The lower deck served as landing platform for the miner, and chain flight conveyors which receive coal from the miner

and deliver it to a 20 ton bin.

The lower deck also included the control center for activating the miner as well as for moving the rig from hole to hole. Top deck included all electrical switch gear, cable reels for power and control cables. The entire structure was mounted on four hydraulic jacks to facilitate adjustment of the rig to the natural bottom and coal seam conditions.

The miner itself was crawler mounted, driven by a variable speed motor. The mining or boring end of the machine consisted of four overlapping cutting heads equipped with tungsten carbide bits. The overall size of the hole "mined" was 38" high by 9' 8" wide, giving it a capacity of 1.3 tons per foot advance. All operations of the miner are similar to any boring type continuous miner except that operations are "remote" controlled from the rig platform.

Since this was a remote controlled job, the operator was usually stationed 700' to 1000' from the working face, depending upon the location of the miner in the coal seam. The operator was stationed on the lower deck of the rig with his battery of indicating and control instruments, numbering about 20 in all. One cable carrying 14 conductors used for

power and control was mounted on a reel with 1000' capacity.

Vertical positioning of the miner was indicated by "stratascope" or electronic sensing device. Two such units were mounted, one on each outer-most cutting tooth of each outside cutting head. The stratascope was coupled to two polar oscilloscopes connected to circular screen so that the path cut by each sensitized tooth was registered on the screen.

When the stratascope teeth cut through anything harder than coal, irregular blips appeared on the screen and corrections were made by the operator actuating a hydraulic jack to raise or lower the head.

Drift from side to side on course was controlled and corrected by using a drill at the side of the miner next to the rib. Every 30' when new conveyor section was added the drill started to bore through the rib, being set to reverse automatically after breaking through the rib. If drifting occurs either way, the depth of the rib hole shows the amount of drift and necessary correction made.

During the experimental period, the mining depth was limited to 700' due to number of pans then available.

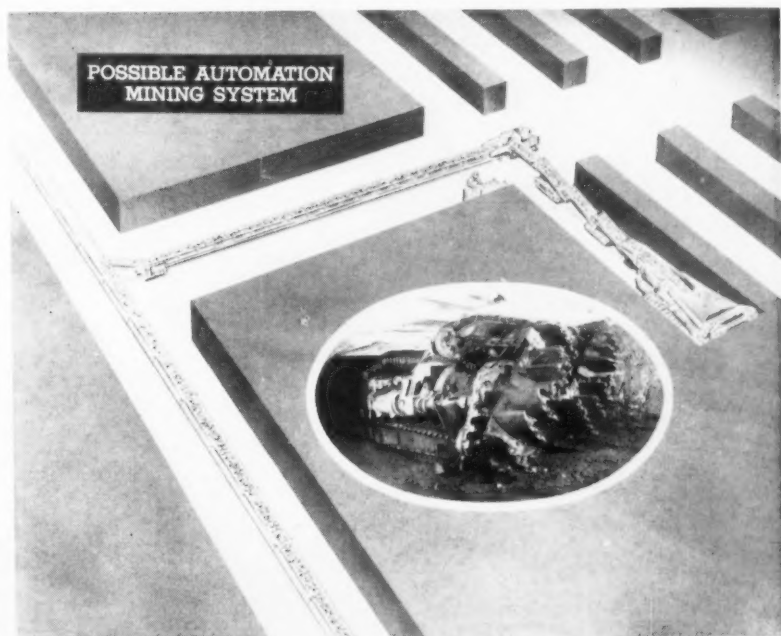


Figure 5—Possible Automation Mining System—1958—?. Using 1 place—1200 to 2000 tons—300 to 500 tons per faceman day.

A 1000' or even 1500' mining depth could be made with proper preparation.

Since this project was experimental, no effort was made to attain record tonnage, rather the objective was a good day to day average production. On this basis a production of 560 tons was attained with a face crew of 4 men, thus averaging 140 tons per face man-day.

"Coal Mine Automation"

Remote control mining system is the beginning or first phase of "Coal Mine Automation." Development and experiments are currently proceeding on completely automatic loading units, together with accompanying necessary face transportation, roof support, ventilation, and maintenance. Briefly, some of the current developments are: —

For face transportation of coal, a transfer extensible conveyor is being developed that will extend from 25' to 100' in about one minute by simple push button control. It will be capable of handling at least 10 tons of coal per minute. This is sufficient capacity to service any automatically controlled loading unit for the foreseeable future.

The roof support problem too is receiving close attention. Currently, experiments are being conducted on a self contained beam or boom with

nested legs that can be setup in about a minute. Set on 4' centers this is equivalent to 10 tons of coal per minute productivity based on miner advancing at the rate of 4' per minute.

Ventilation too is getting a close look. Many new ideas are being advanced and considered. Foam for dust suppression, Joy-Microdyne for dust collection, roof injection, etc. Foaming agents can be compounded to last one to two months on roof and ribs. Auxiliary blowers are again receiving renewed attention. And a self advancing line brattice, utilizing expendable plastic sheet is a neat possibility.

Maintenance itself will be automatically reduced when using automatic machinery — through better materials, better machine design, better and more uniform operations control, etc.

Generally speaking, the evolutionary transition from manually controlled loaders, to remote control, then to automatic control is one of degree. The operator — man or instruments — must OBSERVE; EVALUATE; DECIDE; and ACT.

But manual control either at the machine or from a remote spot is dependent upon human instincts and responses, which are based upon chemical and mechanical relationship with a definite limit to speed of

response. Humans get tired and bored, need rest, etc. Automatic devices do neither and will function uniformly all day.

Automation, like man, acts through intelligence; usually transmitted electrically. For a machine to follow the mine floor automatically requires a device that can differentiate between rock and coal. There are several way to do this. The simplest is that dependant upon the fact that the electrical conductivity of coal and rock is about 4 to 1, with rock having the higher conductivity.

Thus it is a simple matter to place two hardened steel insulated buttons in contact with the bottom at all times to indicate contact with coal or rock. A simple electronic circuit then operates a solenoid valve to move the machine up or down.

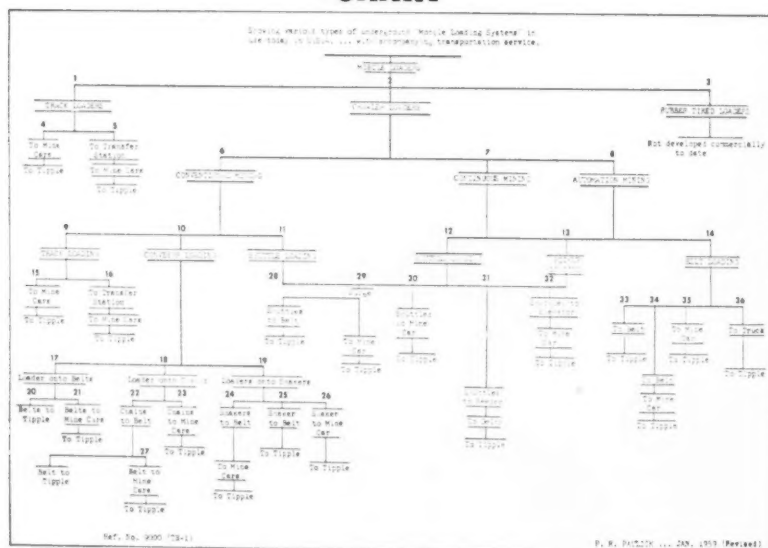
This illustrates the basic requirement for automatic control of machinery — automation. Each operation to be automated must have 3 main functions; a sensing device to OBSERVE; a means to convert electrical energy from the sensing device into control action via a computer EVALUATE and DECIDE; and a servo valve to mechanically cause the machine to alter its operation ACT. These steps eliminate inefficient human attention and action. Cost of such automatic controls is conjectural, but should not be more than \$50,000 per machine unit.

Currently, continuous miners are being built to produce 5, 6, or even 8 tons per minute. Manual operation of such machines will produce 400 — 500 and in extreme cases 800 — 900 tons of coal per shift.

With automatic controls, loading machines can be designed and built to produce 10 to 20 per minute. Eliminating human frailties, fatigue, etc. such machines can produce 1500 to 2000 tons per shift, or 300 to 500 tons per face man-day.

Ironically enough, negative capability, rather than positive capability seems to be the criterion of our creative technical development pace. Machines and systems development is often dependent, not upon what we can do, but rather upon what we are forced to do by our competition.

CHART



Highway Equipment Company Adds 5 New Lines



D. L. Reynolds
President
Highway Equipment Company

Highway Equipment Company, Pittsburgh and Du Bois, is now serving as distributor for 5 additional equipment manufacturers. This announcement was made recently by J. F. Docherty, Highway chairman of the board, and D. L. Reynolds, president.

New firms represented by Highway, and their product lines, are:

Tractomotive Corporation, rubber tired front end loaders.

Buffalo-Springfield Roller Co., rollers and Kompactors.

Roger Brothers Corporation, trailers.

The Heltzel Steel Form and Iron Company, bins, batchers and steel forms.

M-R-S Manufacturing Company, wheel tractors and scrapers.

In addition to these new firms,

Highway continues to serve as distributor for the following:

Allis Chalmers tractors, engines, road machinery, scrapers and graders.

Lima shovels, cranes, draglines and Roadpackers.

Master vibrators, generators and power trowels.

Thor air tools.

Gar Wood ditchers and fine graders.

Jaeger compressors, mixers, pumps, spreaders, finishers.

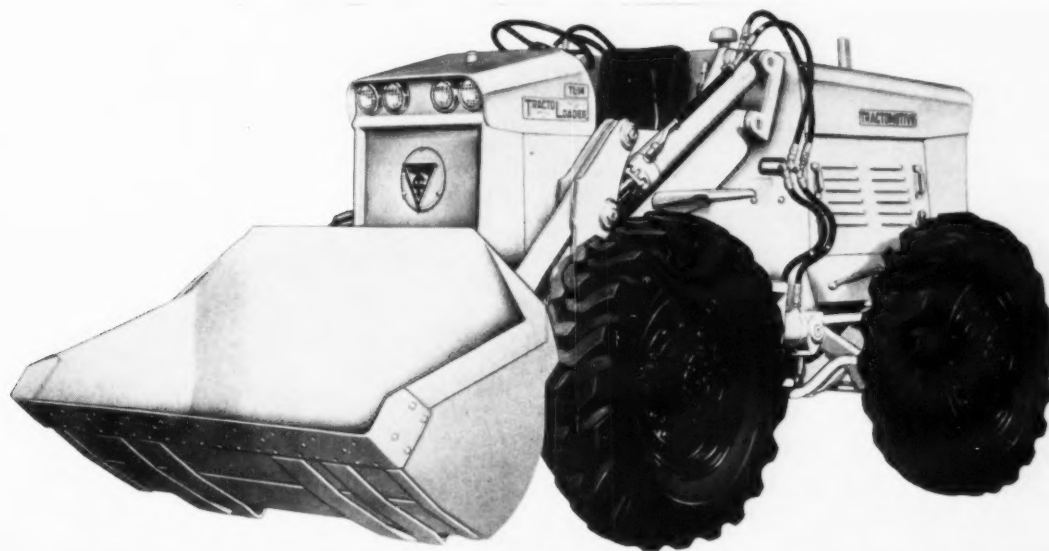
Highway, one of the nation's largest suppliers of coal mining equipment, has 168 employees in its 2 plants in Pittsburgh and DuBois. Its 35,000 sq. ft. Pittsburgh plant is situated on a 3-acre plot at 6465 Hamilton Avenue. At 40 Hoover Avenue, DuBois, a branch,



J. F. Docherty
Chairman of the Board
Highway Equipment Company

opened last year, has a 15,000 sq. ft. building in the midst of 2 acres.

Both at Pittsburgh and DuBois, Highway offers complete 'round-the-clock parts and service facilities on all of its equipment lines. The company also has extensive used equipment and rental departments.



Tractomotive TL-14 Tractoloader has many coal industry applications. It is one of the important new equipment lines distributed by Highway.

Coal Show Visitors to View New Caterpillar Products

● Efficiency-minded coal operators attending the American Mining Congress Coal Show May 11-14 will get a first-hand view of several new Caterpillar Tractor Co. products engineered for economical productivity.

Earthmoving products scheduled to be on display at the Statler Hotel in Cleveland include the D9 crawler Tractor, the new D8 Series H Tractor, the new No. 14 Motor Grader and a wheel tractor-scraper. Two Cat industrial Diesel Engines, the D353 Electric Set and D311 naturally-aspirated power unit, also will be on exhibit.

At a special session of the coal show, C. R. Fahnestock, application engineer at Caterpillar, will describe a new, simple and inexpensive method of seismic analysis developed by Caterpillar.

With the aid of a portable, electronic counter and a sledge hammer of given weight, it is possible to determine the composition of subsurface materials to depth of 40 feet. The technique, of special interest to strip mine operators, is particularly useful in determining whether consolidated material can be ripped or must be blasted.

The Cat D9 Tractor on display will be equipped with a No. 9U bulldozer and the big Kelley ripper. The 320 flywheel horsepower tractor with its 8-foot hydraulically-controlled ripper has given open pit operators an economical, dual-purpose machine — one that not only rips thick seams of coal but strips, 'dozes and stockpiles as well.

Utilizing the tractor's 30-ton weight and 63,000 drawbar pounds pull (maximum), the long ripper shank is capable of fracturing coal to a depth of seven feet.

For many coal show visitors this will be their first glimpse of the new turbocharged D8 Series H Tractor. More powerful than its predecessor, the new D8's flywheel horsepower has been increased to 225, its maximum drawbar pounds

pull to 52,250. Torque rise has been increased to 20% for still greater lugging ability. The rugged unit is 4,377 pounds heavier than the previous model. The direct drive ver-

sion on display will be equipped with an hydraulically-controlled angling bulldozer with Preco back ripper, and a rear-mounted No. 8 ripper. New features common to



The powerful Cat D9 Tractor and giant Kelley Ripper, a matched combination designed for economically ripping coal seams to a depth of seven feet, will be one of several products on display at the Caterpillar exhibit of the American Mining Congress Coal Show, May 11-14 at Cleveland, Ohio. The highly productive tractor-ripper team, shown fracturing a coal seam at a Kentucky mine, has saved the mine owners as much as \$27,000 a year over blasting.



American Mining Congress Coal Show visitors will see the D353 Series C 225 KW Electric Set, one of several Caterpillar products on display. The engine is rated at 390 HP at 1300 RPM. Popular in excavator and stationary power applications, the D353 is shown powering a BE54-B excavator in a contour stripping operation in Tennessee. The excavator, one of three similarly powered at the mine, is being used to remove 25 to 50 feet of overburden over a 32-inch coal seam.

Clark & Krcmar Coal Co., Portersville, is another of the leading mines that depend on Lima 2400s and other fine equipment from Highway.



Highway helps mines run better!

There are 3 reasons why equipment from Highway boosts your production . . . and your profits!

1. Each Highway representative is a trained, experienced equipment specialist. He helps you select exactly the right machine for your job.
2. Equipment from Highway is the finest, most modern available. It is backed by 2 iron-clad guarantees—the manufacturers plus Highway's own warranty of performance.
3. Highway's 'round-the-clock service keeps your work moving steadily without interruption . . . cuts downtime to the minimum.

See your Highway representative for all your equipment needs!

AA-5003



Lima 2400 strips overburden for Iseman Bros., New Bethlehem.

Highway



HIGHWAY EQUIPMENT COMPANY

6465 Hamilton Ave. • Pittsburgh 6, Pa.
40 Hoover Ave. • Du Bois, Pa.

Allis-Chalmers • Lima Shovels, Cranes, Draglines

Master • Thor • Gar Wood

Lima Roadpackers • Jaeger

Michigan Tractor Shovels and Excavator-Cranes

Perry-Ross Coal Co.

both the D8 and D9 are the new dry-type air cleaner and lifetime lubricated track and carrier rollers and idlers. Lubricated and sealed during factory assembly, the rollers and idlers need no further lubrication until rebuilding.

On public display for the first time will be the No. 14 Motor Grader with the first power unit to be offered with a turbocharger. Largest and most powerful grader built by Caterpillar, it is rated at 150 horsepower, has an 18% torque rise and weighs more than 29,000 pounds. Over 75% of the weight rests on the drive wheels. This gives the unit unusual traction and allows it to utilize its power fully.

The transmission provides six forward and two reverse speeds. Forward travel speeds range from 2.6 mph in first gear to 21.6 mph in sixth.

Among the No. 14's many other new features are power assisted brakes, power steering, a positive, mechanical anti-creep lock for the power controls, and higher, thicker moldboard. The moldboard has a full five-inch clearance between blade top and circle drawbar. A retained feature is the exclusive Cat oil clutch, proven for its long life and minimum maintenance requirements. In all, the machine is ruggedly built to meet the heavy demands of coal mine operations.

Coal show visitors also will see the new, fully transistorized Preco blade control of the No. 14. The automatic control takes the guesswork out of fine grading.

Also on display will be the D353 Series C 225 KW Electric Set with automatic start-stop for immediate load pick up in the event of power failure. The engine is rated at 390 HP at 1300 rpm. This is similar to the engine that powers the Cat D9 Tractor.

It has been popular in excavator and stationary power applications, where heavy-duty construction and lower rpm give greatest dependability. It features a turbocharger and dry-type air cleaner.

"Two-handed" power is offered with the D353 Series C. When a

clutch or transmission is coupled to the flywheel and a generator to the other end of the crankshaft, full horsepower and electrical power can then be produced at the same time.

A D311 Series H Industrial Power Unit will also be displayed. It

offers high output in a compact unit, while retaining the features of heavy-duty design. This unit has a low profile, making it possible to fit into confined areas. It is often used in coal fields to power small locomotives, drills, compressors, welders and 30 KW generators.



Increased bulldozing production is one of the prime benefits of the new Caterpillar Series H D8 Tractor, which was introduced to the trade recently. The manufacturer provided simultaneous availability of both direct drive and torque converter drive models, each being powered by a 225 (flywheel) horsepower, turbocharged engine. Drawbar horsepower of the Series H D8 is 180, an increase of 16% over its forerunner.



Ditching work with a motor grader requires power and high production, both of which are features of the new Caterpillar No. 14 Series B Motor Grader. High production is assured through a balanced relationship of size (19 ft. 2 in. wheelbase), weight (29,280 pounds), and horsepower (150 hp, turbocharged engine). Adequate traction is assured by the 22,270 pounds of weight resting on the drive wheels. A large capacity 12-foot moldboard, 27 inches high, is coupled with forward travel speeds ranging from 2.6 to 21.6 mph. Other production boosters standard on the No. 14 include power assisted brakes, power steering and a new positive mechanical lock on the power controls. The complete range of blade positions, including the 90 degree maximum bank cutting angle has been retained.

Perry-Ross Coal Co. maintains production schedules with **Allis-Chalmers HD-21s**



HD-21s strip, fill, build access roads . . . no job is too tough.



◀ Ability to push bigger loads is outstanding HD-21 feature.

No job is too tough for the Allis-Chalmers HD-21s at Perry-Ross Coal Co., Harlansburg.

And—that's why more and more leading Pennsylvania mines are now standardizing on A-C equipment . . . sold, serviced, guaranteed by Highway!

A.A.-8675

Highway



HIGHWAY EQUIPMENT COMPANY

6465 Hamilton Ave. • Pittsburgh 6, Pa.
40 Hoover Ave. • Du Bois, Pa.

308,822 yds. a month
in first quarter 1959, working 572 hrs. a month



Page Diesel Model 726, with 12 yd. bucket and 150 ft. boom, has averaged over 300,000 yds. a month for five years in overburden averaging 80 ft.—Sandstone, shale and limestone.

Have you ever seen such yardage — in such tough overburden?

It takes a Page to do it. Unusually fast swing, and correspondingly fast hoist line, adds up to quicker cycles and **MORE YARDAGE.**

And the rugged strength that's built into these machines is giving owners the least downtime, and lowest maintenance per yard, they've ever had.

Get our estimate of your own stripping costs with a Page. Write, wire or phone —

FRANK SWABB EQUIPMENT COMPANY

Hazleton National Bank Bldg , Hazleton, Pa.

Phone GLadstone 5-3658

For High Production and Lowest Operating costs —

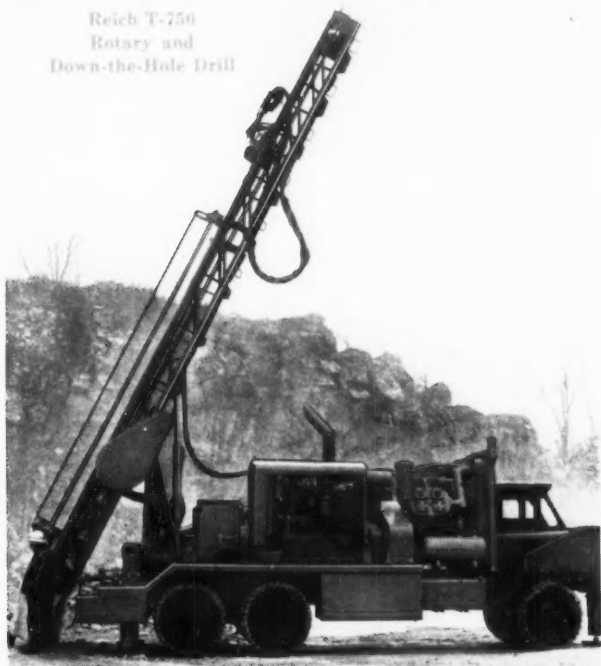
NOTHING equals this PAGE 700 series
SINGLE DECK WALKING DRAGLINES

Prove it **ON YOUR OWN** **WORK** ... side-by-side with your present equipment

We're GLAD to demonstrate! If the Reich doesn't *out-drill any other rig you may have* — pound for pound of weight, and dollar for dollar of investment — we won't expect you to be interested.

Drilling blast hole in hard sandstone and shale, owners report up to 80% more hole with the Reich, than with other rigs of same rating. That's why you see so many of the largest and most successful coal companies using the Reich.

Reich T-750
Rotary and
Down-the-Hole Drill



Reich C-850
Rotary and
Down-the-Hole Drill



FOR BIGGEST PRODUCTION,
you need the Reich's —

Exactly Right Drilling Speed in every stratum (it is the only hydraulic rotary giving ANY speed of rotation); **Fastest Stem Loading**, just a few seconds; **Easiest Operation**, with minimum levers, hydraulically actuated. A real one-man rig.

For Demonstration write, wire or phone —

FRANK SWABB EQUIPMENT CO.

Hazleton National Bank Bldg.
Hazleton, Pa. Phone Gladstone 5-3658

Your **SAFEST** way of buying a **REICH**
is our **SUREST** way of selling it

● To satisfy immediate rock dusting requirements in limited work areas of coal mines, a new M-S-A Model 80 Slurry Rock Dust Distributor for machine mounting is now being marketed by Mine

Safety Appliances Company, Pittsburgh.

The new rock duster is designed for permanent mounting on any mining machine, including a continuous miner, loading and cutting machines, roof bolter, coal drill and similar motor-powered equipment.

When attached to any unit which furnishes one horsepower, the duster can be powered either mechanically or hydraulically direct from the mining machine.

The new M-S-A Model 80 has a tank capacity of 80 pounds of rock dust to 4.8 gallons of water and delivers one complete batch in $3\frac{1}{2}$ minutes at a discharge rate of

50 pounds-per-minute. Using the standard nozzle and 50 feet of hose, approximately 17 lineal feet of rib and roof can be rock-dusted in $1\frac{1}{2}$ minutes.

With the tank of the duster loaded to capacity, only two minutes of agitation by a manually operated rotator is required to mix a single batch of slurry.

The new M-S-A Model 80 Slurry Rock Dust Distributor (complete with discharge nozzle but less motor), Catalog Part Number AM-81685, and the 50-foot long M-S-A Slurry Rock Dust Hose with couplings, Number AM-60297, are available from Mine Safety Appliances Company, Pittsburgh.

RELIABLE HEAVY EXCAVATION EQUIPMENT Draglines, Shovels, Cranes, Drills, Trucks

15-W Bucyrus-Erie Elec. Drag, 215', 13 yd.
9-W Bucyrus-Erie Diesel Drag, 160', 11½ yd.
9-W Bucyrus-Erie Diesel Drag, 200' 9 yd.
7400 Marion Diesel Drag, 175', 13 yd.
7400 Marion Elec. Drag, 175', 12 yd.
625 Page Diesel Drag, 150', 10 yd.
621-S Page Diesel Drag, 125', 7 yd.
200-W Bucyrus-Erie Diesel Drag, 125', 6 yd.
5-W Bucyrus-Erie Diesel Drag, 100', 6 yd.
2400 Lima Dragline, 130', 5 yd.
4500 Manitowoc Drag, 120', 5 yd.
120-B Bucyrus-Erie Elec. Drag, 115', 5 yd.
111-M Marion Drag, 100', 4 yd.
1601 Lima, 4 yd., Shovel/Drag
3900, 3500 & 3000 Manitowoc Cranes
5560 Marion 26 yd. Elec. Shovel
750-B Bucyrus-Erie 20 yd. Elec. Shovel
5480 Marion 18 yd. Elec. H. L. Shovel
151-M Marion 7 yd. Elec. Shovel
170-B Bucyrus-Erie 6½ yd. Elec. Shovel
4161 Marion 6 yd. Elec. Shovel
2400 Lima 4½ yd. H. L. Shovel
120-B Bucyrus-Erie 4 yd. Elec. Shovel
4500 Manitowoc 5 yd. H. L. Shovel
111-M Marion Standard & H. L. Shovels
3500 Manitowoc Standard & H. L. Shovels
54-B Bucyrus-Erie Standard & H. L. Shovels
Large selection of smaller Shovels and
Draglines available
Model T-750 Reich Truck Mounted Rotary
and Down-the-Hole Drill
McCarthy & Compton Coal Auger Drills
Euclid trucks, truck cranes, dozers, scrapers,
front end loaders, attachments and other
misc. equipment available.

FRANK SWABB Equipment Co., Inc.

313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa., GLadstone 5-3658

FOR SALE
DRAGLINE - MARION Model 111-M
Cat. D-375 Diesel, 80' Boom,
4 Yd. Bucket. Priced to Sell.
ANDERSON EQUIPMENT COMPANY
P. O. Box 427 • Bridgeville, Pa.
(Pittsburgh Area)
LEhigh 1-6020



MACWHYTE

WIRE ROPE · SLINGS · WIRE ROPE ASSEMBLIES



NORTHEASTERN INCORPORATED

321 Cherry Avenue N. E.
GL 6-7333 Canton, Ohio

75 Maysville Avenue
GL 2-3602 Zanesville, Ohio

1-48" Wide x 963' Long Link Belt Overland Belt Conveyor

w/100 h.p. Drive, mounted on 6" channel, in 18' sections, bolted construction, 6" Carrying and Return Rollers w/grease type bearings complete w/Manhattan Master Belting, 8 ply, ¼" top cover, 3/32" bottom cover. Excellent condition. Photos available on request.

ELECTRIC AND MACHINE SUPPLY COMPANY

WHITESBURG, KENTUCKY
POST OFFICE BOX 610
PHONE: #2223

CLARKSBURG, WEST VIRGINIA
POST OFFICE BOX #227
PHONE: #MA 3-0253

SALEM "HERCULES" AUGERS FOR ELECTRIC DRILLS

Made to Withstand High Drilling Speed Whip And Torsional Strain Of Electric Drills.



Drills holes faster—Will not snap off shank or chip points—Outlasts four or five ordinary augers.

THE SALEM TOOL COMPANY

EDgewood 7-3416

SALEM, OHIO, U.S.A.

EFFICIENT...



WILLISON COUPLERS

The Willison has only four moving parts.

SAFE...



WILLISON COUPLERS

No need for men to go between cars to couple or uncouple.

STRONG...



WILLISON COUPLERS

Coupler and head shank are one-piece steel casting with over 400,000 pound ultimate strength.

VERSATILE...



WILLISON COUPLERS

Used on all types of mine cars and locomotives; with accessories, can couple with link-and-pin hitchings; can be used with cables on incline haulage or odd pulling requirements.

PROVEN...



WILLISON COUPLERS

Over 100,000 Willisons in service in the U. S. and overseas.

- Rubber Cushioned Units
- Mine and Industrial Car Trucks
- NACO Steel Wheels
- NACO Steel Links and Swivel Hitchings

NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

Established 1868

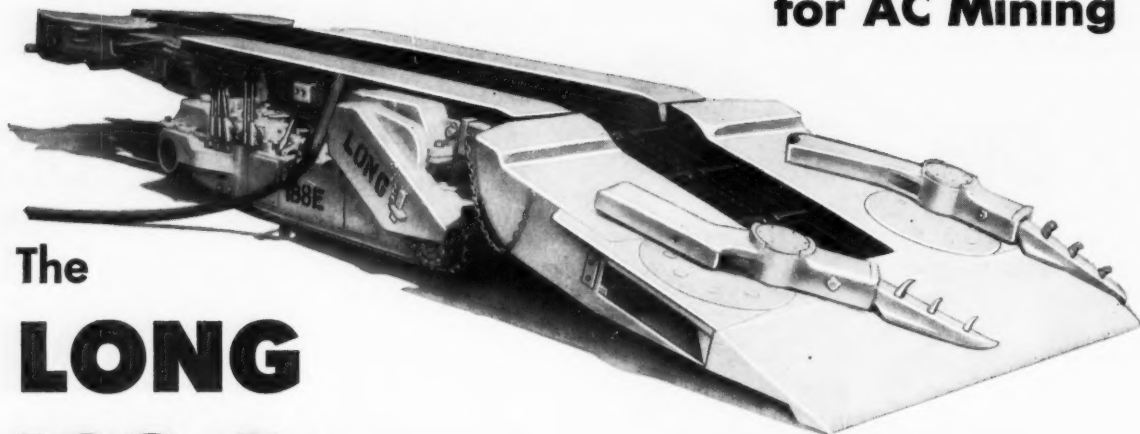
*Transportation Products Division
Cleveland 6, Ohio*

*International Division Headquarters
Cleveland 6, Ohio*

*Canadian Subsidiary
National Malleable & Steel Castings
Company of Canada, Ltd., Toronto 1, Ontario*

NEW from **LONG...**

**Low Height, high performance 80 HP loader
for AC Mining**



The LONG 188-E

Makes Maximum Use of AC design advantages

Unlike DC motors, AC types do not develop maximum torque when starting—also high inrush currents are characteristic with AC motors starting loaded. In the LONG 188-E, a single 80 HP motor powers the machine through clutches with full pull-out torque available. This single motor is started light and runs continuously during operation, with all machine functions controlled by a single bank of finger-tip control valves. The result—inrush and torque problems characteristic of multi-motored designs are eliminated. In addition to the 80 HP motor, one circuit breaker, one size 4 contactor, and one pushbutton complete the electrical circuit of this powerful loader.

Offers greater simplicity—top performance

Only LONG manufactures single motor gathering arm loaders with full independent crawler control. This highly successful feature permits the machine to turn in its own length and, combined with extra

length crawlers, extra power and high speed gives the 188-E maximum maneuverability.

Provides high-capacity operation

The 188-E, with its greater power, stepped-up speed and clutch capacity, will maintain loading rates of 8-10 tons per minute in heavy going.

Costs less initially—less to maintain

With no more than half the moving parts of most multi-motored designs, the 188-E can be depended on for lowest possible maintenance costs, plus economies in spare parts inventory. Simpler design is reflected in important savings in first cost also.

The LONG 188-E is available in overall heights as low as 25 $\frac{3}{4}$ ". Machines specially designed for rock and other minerals also available.

Write for details or a demonstration.

The

LONG

Oak Hill, W. Va.

Company

J. T. FISH FIRST

You can save yourself a lot of time and money when you want to Buy, Sell, or Trade Mining Equipment, Rails, Copper Wire or Supplies, new or used, ANY quantity, large or small.

Just call J. T. FISH. The answer is always yes!

WE OWN WHAT WE ADVERTISE

JOY EQUIPMENT—REBUILT

- 3—Joy 14-BU Loaders, low pedestal, 7AE
- 2—Joy 14BU Loaders, medium pedestal, 7RBE.
- 1—Joy 14-BU Loader, high pedestal, 7CE.
- 6—12BU10E Joy Loaders complete with Piggy Backs.
- 2—Joy 12BU Loaders, 9E, latest type.
- 1—Joy 12BU Loader, 220 volt AC.
- 1—Joy 20BU Loader, latest type.
- 1—Joy 11BU Loader, latest type.
- 1—Joy 8BU Loaders, 250 volt DC.
- 1—Joy 8BU Loader, 34" overall height.
- 2—Joy 8BU Loaders, 220 volt AC.
- 1—Joy curved Bar Head, complete.
- 6—Reliance 24-J Motors, 7½ H.P.
- 4—Reliance 10-J Motors, 5 H.P.
- 20—9-J Motors, 4 H.P.
- 1—Goodman 660 Loader on cats, excellent.
- 1—Goodman 865 Loader on cats, latest type.
- 1—Goodman 865 Loader, 26" high.
- 2—Joy 6SC Shuttle Cars, rebuilt.
- 3—Joy 6SC Shuttle Cars, latest type.
- 2—Joy 5SC Shuttle Cars, rebuilt.
- 2—Joy 32E9 Shuttle Cars.
- 2—Joy 32E10 Shuttle Cars, rebuilt.
- 2—Joy 32E15 Shuttle Cars, rebuilt.
- 4—Joy 32E16 Shuttle Cars, rebuilt.
- 2—Joy 42E16 Shuttle Cars, rebuilt.
- 8—Small rubber tired Shuttle Cars.
- 3—Low Vein Rubber Tired Tractors.
- 3—Joy CD-22 Drill, like new.
- 10—Joy T-2-5 low pan Cat Trucks.
- 1—Joy T-2-6 low pan Cat Truck with reel.
- 2—Joy T-1 Standard Cat Trucks, 220 AC.
- 1—Joy T-1 Standard Cat Truck, 250 DC.
- 2—Goodman low pan Cat Trucks, like new, latest type.
- 4—Joy 11-B Cutting Machines, like new, 35 and 50 H.P.
- 1—Joy 7-B Cutting Machine, like new, 250 volt DC.
- 2—Goodman 212 Cutting Machines, 19" high.
- 4—Goodman 312 Cutting Machines, 17" high.
- 3—Goodman 412 Cutting Machines, 19" high.
- 2—Joy 7-B Cutting Machines, 220/440 volt AC.
- 1—Goodman Machine on Cats, 31" high. All hydraulic.
- 6—Goodman 512 Machines with Bugdusters.
- 1—Goodman 512 Cutting Machine, perfect.
- 3—Goodman 112 Cutting Machines, 220/440 volt AC.
- 1—Lee Norse low vein Machine Carrier on rubber.
- 1—Jeffrey 70 URB rubber tired Cutter. Universal head, perfect condition.
- 2—Joy 11RU Rubber Tired Cutter with bugdusters. Universal head, like new.
- 1—Sullivan 7AU on rubber. Universal Head.
- 2—Jeffrey 29UC Cutting Machines. Universal head, cuts anywhere in seam, 38" high, on cats, 250 volt DC.

LOCOMOTIVES

- 1—Goodman 6 ton, 91-A, 27" high, armor plate frame
- 2—Jeffrey 13 ton, type MH-110, 36", 42" and 44" Ga.
- 2—Jeffrey, 10 ton, type MH-110, 42" and 44" Ga.
- 2—Goodman 8-30 and 10-30 Locomotives, 26" above rail.
- 1—Jeffrey MH-124, 6 ton, 24" overall height.
- 12—Jeffrey, 6 ton, type MH-88, 42", 44" and 48" Ga.
- 4—Jeffrey, 8 ton, type MH-100, 2½" armor plate frames.
- 1—Jeffrey, 6 ton, type 2186, 22" above rail.
- 3—Jeffrey, 4 ton, type MH-96, 42", 44" and 48" Ga.
- 1—G. E., 4 ton, type 825 Locomotive, 22" high.
- 10—G. E., 6 ton, types 801, 803, 821 Locomotives, 42", 44" and 48" Ga.
- 1—G. E., 8 ton, type 822 Locomotive, 44" Ga.
- 3—G. E., 10 ton, type 809 Locomotives, 42", 44" and 48" Ga.
- 2—Goodman, type 33, 6 ton, 44" and 48" Ga.
- 3—Goodman, 8 ton, type 32A, 36", 44" and 48" Ga.
- 3—Westinghouse, type 902, 4 ton, 42" and 48" Ga.
- 2—Westinghouse, type 904, 6 ton, 44" and 48" Ga.
- 2—Westinghouse, type 906, 44" and 48" Ga.
- 2—Westinghouse, type 907, 10 ton, 44" and 48" Ga.
- 8—Jeffrey MH-78 Locomotive Units, cheap.

Locomotives (Cont.)

- 4—Jeffrey MH-88 Locomotive Units, real bargains.
- 6—Jeffrey MH-100 Locomotive Units, reasonable. Locomotive Trucks and Spare Armatures for all the above.
- 3—Plymouth Diesel Locomotives, 8 and 10 tons, 42" and 44" Ga.

TIPPLE EQUIPMENT

- 5—Complete Tipples, 3 to 5 track, steel and wood.
- 3—Cleaning Plants, 1 Ea. McNally, Roberts and Schaefer, Jeffrey, Washers and Airflow Tables.
- 4—complete Aerial Trams for coal or refuse.
- 3—complete Rope and Button Lines.
- 2—Monitor Lines complete with Drums, excellent.
- 1—Allis Chalmers 5x12 Low-Head Vibrator.
- 2—Allis Chalmers 5x14 Rippflo Vibrators.
- 2—Robins 5x14 double deck Vibrators
- 1—Robins Gyrex Vibrator 4x10.
- 10—Belt and Apron type Loading Booms.
- 6—Shaker Screens
- 1—Robins Car Shakeout.
- 20—Crushers, various sizes.
- Feeders, Belt and Drag Conveyors, Car Retarders, etc.

CUTTING MACHINES

- 20—Joy 11RU, rubber tired, Cutter.
- 1—Jeffrey 70 URB Cutter, rubber tired, Universal Head, low vein.
- 2—Jeffrey 29UC Universal Machines on Cats.
- 1—7AU Sullivan on rubber. Universal Head.
- 1—Goodman on cats, 31" overall height.
- 3—Baby Goodman 212's, rebuilt, 250 Volt DC.
- 2—Goodman 212 Cutting Machines, 19" high.
- 4—Goodman 312 Cutting Machines, 17" high.
- 3—Goodman 412 Cutting Machines, 19" high.
- 4—Goodman 512's with Bugdusters, like new.
- 4—Goodman 512's, rebuilt, or as removed from service.
- 3—Goodman 112's 220/440 volt AC.
- 2—Joy 7-B Cutting Machines, 220/440 volt AC
- 1—Joy 7-B Cutting Machine, 250 volt DC.
- 4—Joy 11B Cutting Machines, rebuilt, 35 and 50 H. P.
- 10—Goodman 12AA's and 112AA's, 250 volt DC.
- 2—Goodman 324 Slabbers.
- 2—Goodman 324 Slabbers.
- 6—Jeffrey 35L's, like new, 17" high.
- 2—Jeffrey 35L's on low vein trucks.
- 15—Jeffrey 35B's and 35BB's.
- 2—Jeffrey 29B's on track.
- 2—Jeffrey 29C's, track mounted.
- 2—Jeffrey 29L's on track, perfect.
- 2—Jeffrey 29L's on cats—Excellent.
- 3—Sullivan CBT, 220 volt AC.

LOADING MACHINES

- 6—Joy 12BU with Piggy-Back Conveyors
- 16—Joy Loaders, 8BU, 11BU, 12BU, 14BU, 20BU.
- 1—Goodman 865 Loader, 26", on cats.
- 1—Goodman 665 Loader, on cats.
- 1—Goodman 660 Loader, on cats.
- 1—Goodman 460, rebuilt. On track.
- 2—Jeffrey 61 CLR's, on rubber, 26".
- 3—Jeffrey L-500 Loaders.
- 2—Myers Whaley No. 3 Automatic Loaders.
- 2—Clarkson Loaders, 26" above rail.

CONVEYORS

- 2—Joy 30" Underground Belt Conveyors, 500' to 2000' each. Excellent.
- 2—Goodman 97-C 30" Conveyors. 1500' long.
- 3—Robins 30" Belt Conveyors, 200' to 2000'.
- 4—Jeffrey 52-B, 30" Drive and Tail Assemblies, complete.
- 2—Joy MTB 30" Drive and Tail Assembly, complete.
- 3—Goodman 97 HC 30" Drive and Tail Assemblies, complete.
- 8,000' Conveyor Belt, 30".
- 10,000' Conveyor Belt, 26", like new.
- 8—Jeffrey 61AM 12" Chain Conveyors, 300'.
- 2—61EW Elevating Conveyors.
- 2—61WH 15" Room Conveyors, 300'.
- 2—Joy 15" Room Conveyors, 300'.
- 2—Joy 20" Conveyors, 300'.
- 4—Joy Ladel UN-17 Shakers.
- 10—Goodman G-12½ and G-15 Shakers.

CONVERTERS AND DIESEL PLANTS

- 1—300KW Portable Rectifier excellent
- 2—100KW, G.E. TCC-6's, 275 volt, Rotary Converters
- 1—150KW, G.E. HCC-6, 275 volt, Rotary Converter.
- 1—150KW, 6 phase, Allis Chalmers Rotary Converter, 275 DC.
- 1—200KW Allis Chalmers Rotary Converter, 6 phase, 275 DC, perfect.
- 1—200 KW, G.E. HCC-6 Rotary Converter, 275 volt DC. Newly rewound.
- 1—300KW, G. E. HCC-6 Rotary Converter, 275 DC.
- 2—300KW Westinghouse, 6 phase, Rotary Converters, 275 volt DC.
- 2—500KW Westinghouse Rotary Converters, 275 volt DC.
- 2—200KW Westinghouse Rotary Converters, 275 DC. Newly rewound. (all the above with 6900/13000 and/or 2300/4000 primary transformers)
- 2—150KW MG Sets, General Electric and Westinghouse.
- 1—200KW MG Set, Westinghouse, rebuilt.
- 1—200KW MG Set, General Electric, perfect.
- 2—150KW Allis Chalmers MG Sets, 275 DC volt, excellent 220-440 AC volt.
- 1—300KW Westinghouse, 600 volt MG Set, rebuilt.
- 2—300 KW Westinghouse, 600 volt, 6 phase, Rotary Converters.
- 2—500KW Westinghouse, 600 volt, DC, 6 phase, Rotary Converters.
- 2—500KW HCC-6 Rotary Converters, 6 Phase, 600 volt DC.
- 1—GMC 471 Diesel with 60 KW, 250 volt DC Generator.
- 1—GMC-671 Diesel with 75 KW, 250 volt DC Generator.
- 1—GMC-671 Diesel with 110KW, 250 volt DC Generator.
- 1—Cummins 125 KW, Diesel with 250 volt DC Generator.
- 1—Allis Chalmers Natural Gas Engine with 100 KW Generator, 275 volt DC.
- Boilers, like new, 300 H.P.

MISCELLANEOUS

- 5—Complete Tipples, 3 to 5 Track. Wood and Steel.
- 20—Jeffrey Molveyors on rubber tires.
- 1—¾ Yard Shovel and Back-Hoe.
- 1—¾ Yard Crane on Cats.
- Battery Supply Tractors, rubber tired.
- 1—Cantrell Air Compressor on rubber tires.
- 10—Air Compressors, 1 H.P. to 40 H.P.
- 2—Joy self propelled rubber tired compressors, 240 cu. ft.
- 2—Acme self propelled rubber tired compressors, 150 cu. ft.
- 40 Mine Pumps, all types.
- 1—Differential 40 Passenger Man Trip Car.
- 6—MSA Rock Dusters.
- 2—Phillips, Carriers, 44" and 48" Ga.
- 1—Barber Greene self propelled Bucket Elevator. Pipe, Plastic, Steel, Transit, all sizes 1" to 6".
- 300 Mine Cars, drop bottom, 42" Ga.
- 30 Mine Cars, drop bottom, 44" Ga.
- 100 Mine Cars, 18" high, end dump, 44" Ga.
- 300 Mine Cars, end dump and drop bottom, 20" high, 48" Ga.
- 1—10 ton Mine Car Scale with Recorder.
- 15—Brown Fayro HKL and HG Car Spotters.
- 1—12 ton Differential Slate Larry.
- Incline Hoists, 25 to 50 H.P.
- 1—Jeffrey 5' Aerodyne Fan, like new.
- 1—Jeffrey 6' Aerodyne Fan.
- 1—Jeffrey 8' Aerodyne Fan.
- 2—Storage Tanks, 4,000 Gallons.
- 1—Storage Tank, 10,000 Gallons.
- 10,000 Five Gallon G. I. Cans, screw lids.
- 2500 tons Relaying Rail, 25, 30, 40, 50, 60, 70, 80, 8½.
- 100 tons Copper — 4/0 and 9 Section Trolley 1/0, 2/0, 4/0 Stranded. 500 MCM and 1,000 MCM Feeder Cable.
- Thousands of feet of rubber covered three conductor cable. All sizes.
- 300 Transformers from 1 to 300 KVA, 110 to 13,000 primary volts
- 400 Electric Motors, 3 to 250 H.P.
- Huge stock of mine supplies.
- Thousands of Other Items.
- 600—MSA Mine Lamps, Chargers, etc.
- 1—Fricke Saw Mill—Complete.

WE BUY—SELL—TRADE

J. T. FISH

PHONE PL. 2-4400, LOGAN, W. VA.

NEWS ABOUT THE DUMP BODY BUSINESS

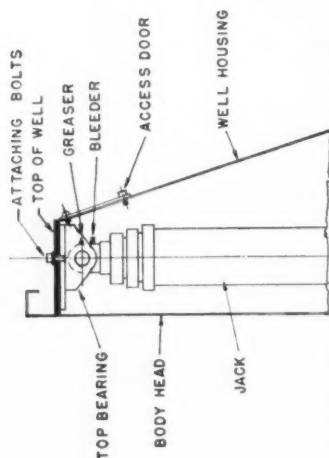
**Increase Your Earning Power with MARION'S
New Front End Hoist For 8, 9, 10 Foot Bodies**

Another rugged and competitively priced Marion hoist is now available in three models for 8, 9 and 10-foot bodies. Outstanding features incorporated in the hoist provide time and performance saving benefits for all users.

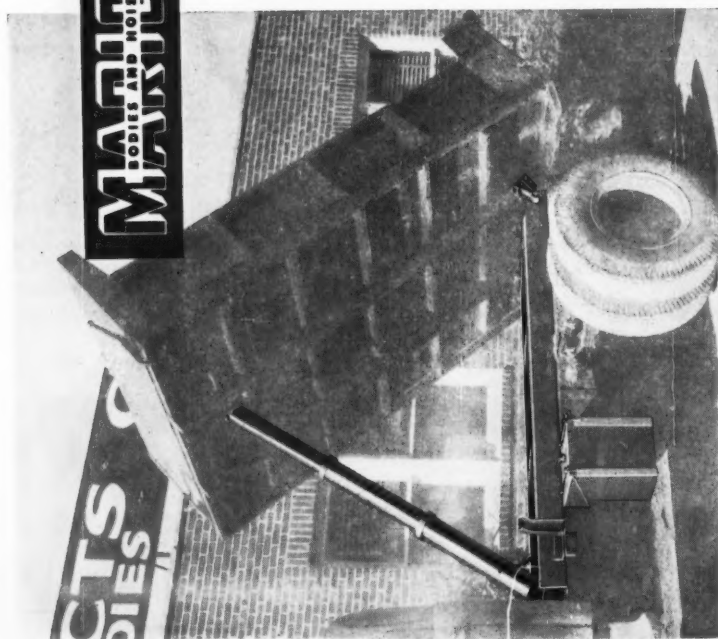
● The method of attaching the cylinder to the body speeds up installation and allows fast, easy detachment for any servicing in the field (see diagram). ● The deep oil reservoir, mounted on the side, provides a quieter, cooler, more efficient hydraulic system and eliminates the danger of drawing air into the system. ● Weight savings from 65 to 90 pounds. ● Fast dumping speed. ● Pump with safety relief valve.

Write for a bulletin covering the three models, F-5137-65-72-82.

MARION METAL PRODUCTS CO.
Marion, Ohio, U.S.A.



The top plate is connected to the top of the cylinder before the body is installed. Then as the body is let down, the cylinder will guide itself into place in the cylinder housing. The body is then secured from the outside at the top by two bolts that fasten the body to the top plate.



ADVERTISER'S INDEX

MAY, 1959

Anderson Equipment Co.	8, 28, 32
Austin Powder Company	Back Cover
Bassler Equipment Co.	8
Beckwith Machinery	2nd and 3rd Cover, 2, 3, 15 to 18
Electric and Machine Supply Company	28
Fish, J. T.	31
Highway Equipment Co.	Front Cover, 7, 10, 23, 25
Long Company, The	30
Marion Metal Products Co.	32
Maximon Machine Company, Inc.	5
Mine Safety Appliances Company	4
National Malleable & Steel Castings Company	29
Northern Incorporated	28
Ohio Machinery Co.	15 to 18
Paulick, P. R.	32
Salem Tool Company, The	1, 28
Scottdale Machine, Foundry & Construction Co.	6
Swabb Equipment Co., Frank	26, 27, 28
Walker Machinery Co.	15 to 18
Woodings Inc., Robert T.	5

● The Salem Tool Company will have a complete display of McCarthy Coal Recovery Drills for open pit mining, McCarthy Horizontal and Vertical auger drills for shot hole drilling and in addition illustrated slides and talkies of *Underground Salem Coal Augers* used for coal recovery drilling, ventilation drilling, exploration drilling and entry driving at the Cleveland, Ohio Machinery exposition in May.

New bulletins and catalogs of accessory equipment will be available.

We will have a full staff of consulting engineers and salesmen on the job constantly. Mr. J. H. Wilson, Jr. will be in charge.

MANITOWOC — Model 3500 Stripping Shovel.
Caterpillar 17,000 Diesel, 2 Yd. Dipper.
Can be seen working. Attractive Price.

ANDERSON EQUIPMENT COMPANY
P.O. Box 427 • Bridgeville, Pa.
(Pittsburgh Area)
LEhigh 1-6020

P. R. PAULICK

Consulting Mining Engineer

Specializing: —

Cost Control Management
Modern Mine Mechanization Systems
Economic Surveys Appraisals
Domestic & Foreign Work

2505 Windgate Road
Bethel Park, Pa.

BARGAINS IN GOOD USED EQUIPMENT

BECKWITH - Your Headquarters for



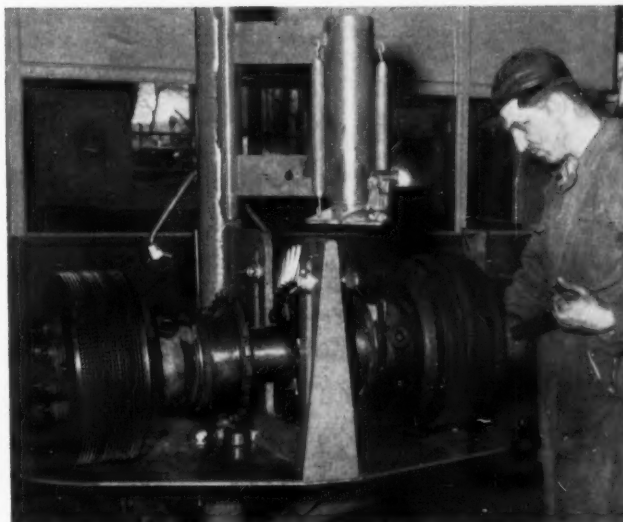
Make Beckwith Machinery Company your source of profit-making machinery in any of the three Caterpillar-standardized classes of good used equipment. If you need productive machines . . . at prices you can afford . . . check with us under any of these three classifications.

For 52 years Beckwith has provided its customers with the services of only the best trained personnel, correct tools and adequate facilities. Integrity and service have been prerequisites in our dealings at all our locations . . . your assurance of honest, work-rated new or used equipment.

To those who have not done business with us previously, we offer not only our reputation in the field, but also the Caterpillar-originated program of "Bonded Buy." This sign identifies the safest buys in used equipment—safest because you get a guarantee bond up to \$10,000, assuring you of satisfactory performance of all parts when you make a "Bonded Buy" on any used Cat-built machine.

We also offer a "Certified Buy" with our written guarantee covering units of any make manufacture or a "Buy and Try" deal, which carries a written money-back agreement.

Why gamble on used equipment when you know you can get exactly what you want—exactly as it's described? Call or stop in at your nearest Beckwith Location for the latest information on our wide selection of honestly-valued used machinery.



Our used equipment is thoroughly inspected and, as necessary, properly reconditioned or repaired in our modern shops. Caterpillar-trained technicians, equipped with time-saving tools, jigs and fixtures work on these units to put them in good operating condition . . . to keep costs down . . . selling price low.

*Both CATERPILLAR and CAT are registered trade marks of The Caterpillar Tractor Co.

BECKWITH

M A C H I N E R Y C O .

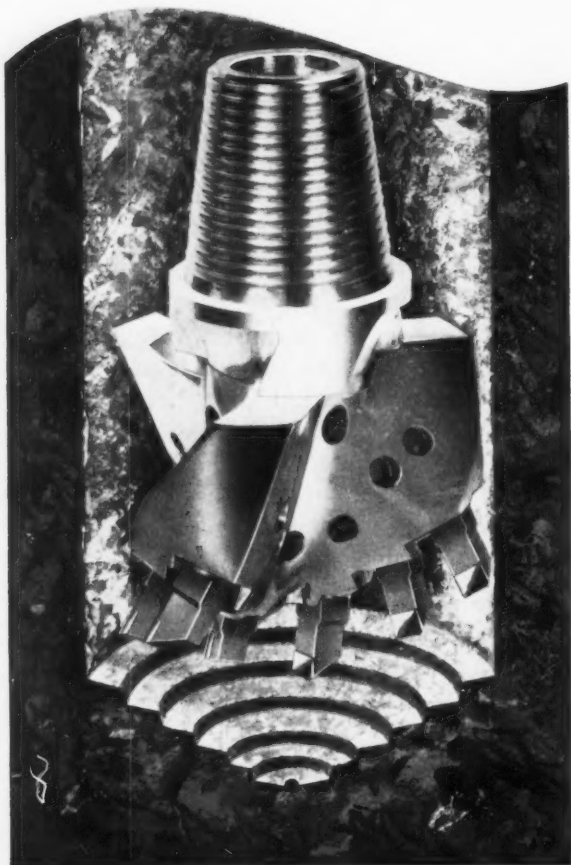
BRADFORD, PA. • 361-369 Congress St. • Phone 3166
CLEARFIELD, PA. • Old Town Rd. • Phone P O 5-9635
ERIE, PA. • 1356 E. 12th St. • Phone 4-2494
SOMERSET, PA. • Rt. 219 N. • Phone Somerset 6533
CLARKSBURG, W. VA. • U.S. Rt. 20 • Phone Main 4-5476

6550 Hamilton Avenue • PITTSBURGH • Phone: MONTROSE 1-6900

AUSTIN APA

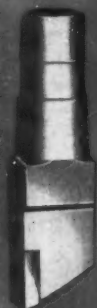
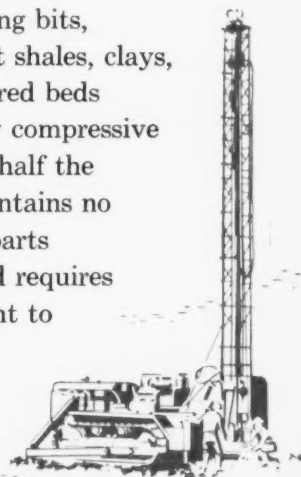
DRILL HEAD

speeds air drilling
cuts costs in soft rock



The 3-wing prop-type Austin APA drill head is specially designed to increase penetration rates and reduce the cost of air drilling in soft rock formations.

When compared with ordinary drill heads with rotating bits, APA cuts through soft shales, clays, shells, soft limestone, red beds and other rocks of low compressive strengths in less than half the usual time. Also, it contains no independent moving parts to become clogged and requires only a moderate weight to gain full effectiveness.



durable bits are easily replaced

APA drill head is furnished with special patented carbide-tipped bits. The latter have tapered shanks that drive-fit firmly into the drill head so that wedges and set screws are not needed. Unlike blade-type drill heads, bits are easily replaced with hammer and punch.

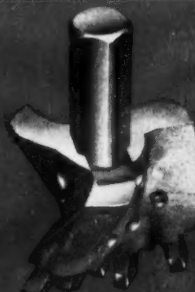
Rapid-cutting carbide-tipped bits drive-fit in drill head. Replaceable in seconds with hammer and punch.

5 SIZES

adaptable to any rig

In addition to the Model APA, Austin produces a complete line of drag-bit drill heads with either square or hexagonal shanks that can be adapted to any type of drill rig. All are offered in 5 sizes for cutting holes of from 4" to 8" in diameter.

Austin drill head with hexagonal shank



AUSTIN POWDER COMPANY

Cleveland 13, Ohio

explosives • permissible dynamites • mine tools
detonating fuse and clips • AP drill heads • Akremite • primers

